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COMPLIANCE REPORT FOR AVOIDANCE OF BIOLOGICAL RESOURCES DURING SEISMIC OPERATIONS ON THE CHEVRON U.S.A., INC. AND SANTA FE ENERGY RESOURCES, INC. MIDWAY VALLEY 3D SEISMIC PROJECT, KERN COUNTY, CALIFORNIA

Prepared for:

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
CALIENTE RESOURCE AREA

On Behalf Of:

CHEVRON U.S.A, INC. AND SANTA FE ENERGY RESOURCES, INC.
BAKERSFIELD, CALIFORNIA

Prepared by:

Stephen P. Tabor, M. S.
TWS - Certified Wildlife Biologist
BioEnvironmental Associates
837 Arbor Ave., Suite A
Fort Collins, CO 80526
(970) 207-0575

Rex E. Thomas, Ph.D.
BioEnvironmental Associates
4130 Saddle Notch Dr.
Fort Collins, CO 80526
(970) 225-9549

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EXECUTIVE SUMMARY

This report presents results of preactivity surveys and compliance monitoring for avoidance of biological resources during seismic operations on the Chevron U.S.A., Inc. and Santa Fe Energy Resources, Inc. Midway Valley 3D seismic project. The project was conducted during late fall 1996 and early spring 1997 near Taft, Kern County, California. The project was permitted under Section 7 consultation with U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, and the U.S. Department of Energy. Detailed descriptions of seismic techniques and design used during this project are presented in Appendix E which includes the environmental assessment and the U.S. Fish and Wildlife Service biological opinion for the project. BioEnvironmental Associates team members conducted surveys for sensitive wildlife and special status plant species along proposed vehicular travel routes throughout the project site using agency accepted protocols for the southern San Joaquin Valley. Exclusion zones were established around biological resources for vehicle avoidance. Mitigation measures defined in the environmental assessment and biological opinion (Appendix E) and in the BLM notice to proceed letter (Appendix D) were implemented throughout the project. Results of biological surveys along vehicular travel routes are presented in Appendix A (Geophone/Receiver Line Survey and Travel Notes) and Appendix B (Source Line Survey and Travel Notes). Monitoring notes for compliance along source and geophone lines are presented in Appendix C.

This project included a total of 558 miles of geophone and source lines within approximately 66 sections. Given the large size of this project and the relatively sensitive nature of some of the habitat in this area (i.e., Buena Vista Valley), project related impacts were minimal. This is due in large part to the willingness and commitment of Chevron U.S.A., Inc., Santa Fe Energy Resources, Inc. and especially the seismic vendor (Western Geophysical) to abide by agency requirements and to alter daily activities at the request of biological monitors.

INTRODUCTION

Chevron U.S.A., Inc. and Santa Fe Energy Resources (Chevron/Santa Fe Energy) conducted seismic investigations just southeast of the city of McKittrick and Derby Acres and in the Buena Vista and Midway Valleys, Kern County, California. Chevron/Santa Fe Energy's geophysical contractor was Western Geophysical Corporation (Western Geophysical). The Midway Valley 3D Geophysical Exploration Project covered approximately 31,444 acres of private lands, 6,880 acres of Department of Energy Lands within NPR2 and 3,840 acres of lands administered by the Bureau of Land Management, in western Kern County, California.

A Biological Opinion for the proposed project was issued by the Acting Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, Sacramento Field Office in Formal Section 7 Consultation with the Area Manager, Caliente Resource Area, U.S. Bureau of Land Management, Bakersfield, California.

BioEnvironmental Associates prepared the draft environmental assessment. The EA presented an overview of the affected environment within the project area using results of a literature review of biological field surveys previously conducted within or adjacent to a proposed 3D seismic project. The purpose was to provide background information to identify potential and known locations of sensitive wildlife and special status plant species within the proposed seismic project area. Biological field surveys, following agency approved survey protocols, were conducted prior to the initial start-up (October 1996) and throughout the duration of the project ending in April 1997 to acquire current resource data to provide avoidance (Appendix A and B) as the project was being implemented in the field. Compliance monitoring of biological resource avoidance was conducted on a daily basis for both geophone (receiver) cable lay-out and pick-up and as vibroseis was being conducted (Appendix C).

Agency documentation and permitting for this project consisted of the following:

Biological Evaluation
BLM Notice to proceed letter - Appendix D
USFWS Biological Opinion - Appendix E
Environmental Assessment - Appendix E
BLM Intent to conduct a geophysical project and - Appendix G
BLM Notice of completion form - Appendix G

The Midway Valley 3D seismic project area and project design (cable lay-out and pick-up, orientation of geophone and source lines, vibroseis techniques and procedure, etc.) has been presented and discussed in detail previously (Appendices C and E). The project was located in western Kern County, California. The approximately 66 square mile project area was bounded by the community of Derby Acres on its west-central border. The prospect included the city of Taft along the southern border ranging north through the Buena Vista hills (NPR2) and northward across the Buena Vista Valley to the southern boundary of NPR1 (Elk Hills). The topography of the study area is generally flat from east to west, but rises into the Buena Vista Hills at its center. Figure 1 shows the project location in relation to the City of Taft, associated topography and

Sections of land. Figure 2 shows receiver (geophone) and source line orientation within the project site. For the benefit of the reader, a brief summary of the project is presented below.

In general, proposed seismic testing included vibroseis using six truck equipped vibroseis units. All project related activities were contained to existing roads and trails; cross country travel occurred only where roads and trails were not available, where sensitive resources could be avoided within the seismic corridors by vehicles, or where no listed resources occurred within agency avoidance criteria within the 50 ft seismic corridor. Recording cables, geophones, and related equipment were positioned over a portion of the project site while vibroseis was conducted. A "move-up" approach was used to move geophone cable to unrecorded lines as vibroseis progressed. Eight to 10 geophone lines were on the ground at all times during the project.

A literature review was conducted of biological field surveys that previously have been conducted within the project area or nearby vicinity (1-5 miles distant from the project area) to identify potential and known locations of sensitive wildlife species on the project site. The biological evaluation prepared by BLM (7/8/96) for the Chevron Belridge 3D seismic project was reviewed and used as an "incorporation by reference" (Item G - Section 402.12 of the Federal Register Vol. 51, No. 106, pg. 19960) approach for presenting background information of similar recent seismic surveys, field survey methods, biological data collected, analyses of potential impacts, and recommended mitigation strategies in a technical report format that may be used in the public environmental review process. The biological evaluation prepared by BLM may be appended to subsequent environmental documentation, i.e., the Environmental Assessment (EA), or may be used as a stand alone document.

Because the project was located in areas that had potential to support populations of threatened and endangered species a biological preactivity survey was necessary to meet criteria of the federal endangered species act (ESA) of 1976 as amended, and the California endangered species act (CESA). The biological survey and assessment were conducted to assess potential impacts of project related activities to threatened and endangered plant and animal species and to provide mitigation to lessen impacts to listed species and their habitat(s). We used agency approved survey methods of the California Native Plant Society, (CNPS 1991), CDFG (1984, 1990), Orloff (1987), Nelson (1987), The California Burrowing Owl Consortium (1993), Tollestrup (1976), and USFWS (1990, 1995) and guidelines given in Section 402.12 of the Federal Register Vol. 51, No. 106, pp. 19960-19963 to survey for sensitive wildlife and special status plant species. In addition, we followed guidelines recommended for seismic operations published in the International Association of Geophysical Contractors (IAGC) "Land geophysical operations: Safety Manual" (IAGC 1991 and current edition).

Compliance monitoring was conducted for biological resource avoidance as stated above. Results of compliance monitoring are presented below. We have presented text taken from the BLM Notice to Proceed letter (Appendix D) which summarized agency required mitigation for this project that was presented in the USFWS biological opinion and the Environmental Assessment (Appendix E).

We coordinated with the cable layout and pick-up crew and the vibroseis crew each day at the morning meeting to provide biological survey data (collected ahead of the crew and from the previous day) for sensitive wildlife and special status plant species and unique habitats. These areas were flagged in the field for project personnel avoidance. Communication occurred between the biologist and the seismic crew via hand-held two-way radio, mobile phone, and at the daily morning meeting concerning these issues. Biologists surveyed for resources and monitored resource compliance throughout the day. Monitors worked in close proximity to and with the crew each day. A biologist was assigned to each crew when the crew was working in areas that were potential habitat for sensitive wildlife and special status plant species. This same approach was used for documenting all sensitive floral and faunal resources, assisting seismic field crews for resource avoidance, and cable and/or vibroseis point rerouting and relocations. Compliance monitoring was conducted on a daily basis as the crew moved through a particular area. An example of a typical day for the biologist is presented below:

1. Attend morning meeting at the Western Geophysical office (ca. 5:30 am) to report on previous days surveys, monitoring, etc. Communication on a daily basis and at numerous times per day was mandatory between the biologist and the seismic crew so that resource avoidance and compliance was met.

2. Dispatch to the field and conduct preactivity surveys for sensitive wildlife and special status plant species and provide compliance monitoring and assistance.

3. Communication with the crew by two-way radio several times per day (as necessary) to assist the crew for reroutes, relocations, planning prior to approaching a sensitive habitat and/or resource.

4. Biologist assisted the crew throughout the day while conducting preactivity biological surveys just ahead of the crew as they progress in laying out cable, moving to a source line, geophone line, etc.

5. At the end of the day, biologists returned to the office and updated the party manager, etc. and the biological resource map(s). Biological resources and sensitive habitats were placed on the map each day. Seismic surveyors digitize these areas into their data base and the crew was briefed on locations and provided with instructions for best practices of avoidance and mitigation for biological resources. The briefing was conducted at the morning meeting the next day and was reinforced to the crew throughout the day as the biologist worked with them.

Compliance issues are addressed by listing requirements of the BLM notice to proceed, and providing a summary of compliance or non-compliance for each mitigation (in bold).

The following was taken from the BLM letter dated 15 November 1996 to John A. Beery of Chevron:

Chevron USA, Incorporated and Santa Fe Energy and their operators will adhere to the terms and conditions and reporting requirements contained in U.S. Fish and Wildlife Service Section 7 Biological Consultation 1-1-96-F-120 dated November 12, 1996.

A. All pin flags, flagging and trash will be collected daily as the project progresses. Off- road vehicle travel paths will be reclaimed according to agency specifications.

All project-related materials were removed from the project site as daily activities proceeded. Geophone cable crews removed flagging, pin flags and other project associated materials along receiver lines as they collected geophone cable to be moved. Vibroseis truck drivers and their "scouts" collected these materials as they proceeded along source lines (Figure 3A - vibes with collected flagging).

The vibe truck monitor(s) recommended reclamation of several areas on the project site where vibe trucks dug into the soil when traction was poor, sunk into the soil during agency required soil moisture tests after rain, and in one case where a vibe truck rolled (Figure 3B - reclamation of area where truck rolled). This included re-grading the affected area with hand tools and mulching the graded area to reduce the possibility of erosion. This technique was employed to minimize the possibility of erosion in several areas where trucks crested man-made berms and broke the berm down.

B. Vibroseis avoidance criteria for off-road locations:

- 200 feet from occupied San Joaquin kit fox natal dens;
- 150 feet from known San Joaquin kit fox natal dens;
- 100 feet from occupied San Joaquin kit fox dens;
- 100 feet from known San Joaquin kit fox dens;
- 50 feet from potential San Joaquin kit fox dens;
- 50 feet from giant kangaroo rat burrow systems;
- 30 feet from burrows where San Joaquin antelope squirrel burrows;
- 30 feet from occupied blunt-nosed leopard lizard burrows;
- 30 feet from badger dens;
- 30 feet from burrowing owl burrows;

These criteria were followed by conducting initial surveys of the flagged drive routes to identify biological resources. Flagged routes were modified in the field to adhere to avoidance criteria. In addition notes regarding resources and modifications to travel routes were supplied to the biological monitors and Western Geophysical personnel (Appendix A & Appendix B). Additionally biological monitors surveyed ahead of both geophone layout crews and vibroseis crews to confirm that reroutes were indeed clear of resources and that no new resources had appeared subsequent to the initial surveys. See Appendix C for biological monitors' field notes on compliance. There were instances, particularly in the Buena Vista Valley, where minimum avoidance criteria could not be met This generally involved potential (no evidence of activity) giant kangaroo rat burrows, which were exceptionally dense in this area. In these cases biological monitors mitigated potential impacts to sensitive species by the following: vehicles were moved through the area one at a time, monitors walked directly in front and beside of each vehicle to ensure that take of listed species was prevented (i.e., burrow crushing, etc.) Portions of these areas are included in the agency recommended long-term monitoring sites. No record of "take" of a listed species was observed in these areas nor throughout the entire project.

C. Access route avoidance criterion for off-road vehicle travel:

No sensitive wildlife resources shall be located within a 50- foot corridor along access routes and receiver lines.

Project modifications made by biologists to ensure maximum avoidance are described in the preceding paragraph.

D. The seismic contractor shall test soil conditions to determine when vehicles can commence activity after the area receives measurable rainfall. The result of soil compaction is a decrease in volume. This decrease can be quantified by measuring the depth of the depression left by the compacting instrument. During the first day of seismic testing, with soil in a dry condition, the project biologist will measure the depth of tire tracks and all vibroseis pad depressions at 20 source points. After measurable rainfall, when surface soils are no longer in a saturated condition, the biologist will measure tire and all vibrator pad depressions at the first source point of the day. If depth measurements of tire tracks and vibroseis pad depressions are more than 75% greater than average measurement taken in dry soil, all off-road vehicle travel will be suspended until conditions improve.

There several instances in which these directions were used and followed, especially during December 1996, and January and February, 1997. In many cases project-related activities in areas of sensitive habitat were suspended for an extended time. Where possible the biological monitor sought out source (vibroseis) points that were on existing roads, well pads, or other developed areas so that a minimal amount of activity could occur on these days.

E. Geophones will be placed on BLM and DOE lands in the following manner:

1. All vehicles will avoid driving on areas of cryptogamic soils.
   The geophones will be walked across cryptogamic soils and areas identified as having high densities of listed plants and deployed by hand in the field.

Deployment of geophones through areas of cryptogamic soils or high densities of listed plants, by foot travel only, was observed by biological monitors.

2. If necessary, biological monitors will be on-site during geophone placement to identify sensitive areas to avoid.

Biological monitors accompanied geophone layout/pick-up crews in all areas identified in initial surveys as containing listed biological resources or sensitive habitat.

3. Selected geophone lines may be marked on BLM lands to provide line location for post-project monitoring.

Portions of geophone lines and entire source lines (30 total) have been identified in suitable habitat for post-project long-term monitoring by BioEnvironmental Associates staff.

4. All source points in areas, on BLM lands, that are found to have high densities of listed plants will be relocated.

Source points in all areas of the project that were found, during initial biological surveys, to lie within areas of high densities of listed plant species were relocated to agency specified avoidance requirements, or were eliminated.

5. No off- road vehicle travel (except by ATVs) in areas found to have any densities of listed plants. Vibrator trucks will follow flagged routes around areas of listed plants on BLM lands. A 50 foot avoidance zone for Hoover's wooly star will be enforced.

Source points throughout the project that were found, during initial biological surveys, within areas of high densities of listed plant species were relocated to agency specified avoidance requirements, or were eliminated. Deployment of geophone cable in all areas of the project that were found, during initial biological surveys, to lie within areas of high densities of listed plant species was performed primarily on foot or by use of ATVs.

F. To minimize the potential for incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat the following reasonable and prudent measures are required:

1. The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats shall be minimized.
2. The potential for inadvertent entrapment of San Joaquin kit foxes, blunt-nosed leopard lizards and giant kangaroo rats in dens and burrows shall be minimized.

Criteria 1 and 2 above were adhered to by following minimum avoidance criteria described previously.

3. The extent of off-road survey routes and other seismic testing areas shall be minimized.

In all possible cases source points and travel by geophone layout/pick-up crews was relocated to existing roads to minimize off-road travel.

4. The potential for unauthorized vehicle use of off-road survey routes shall be minimized.

Biological surveyors/monitors were vigilant about unauthorized off-road vehicle travel on the project site. None was observed during the life of the project.

G. The seismic contractor shall provide compliance with the following terms and conditions, which implement the reasonable and prudent measures described above:

The potential for harm or mortality to listed wildlife species and their habitats shall be minimized by implementing the following procedures:

All measures as proposed by USFWS (1996) for the Chevron/Santa Fe Midway Valley 3D seismic project shall be followed. Mitigation measures presented below incorporate such requirements of the proposed Midway Valley 3D seismic project.

Prior to the onset of ground-disturbing project activities, a qualified wildlife biologist shall provide an employee orientation program to project personnel on the occurrence and distribution of listed species in the project area, measures being implemented to protect these species during project actions, reporting requirements shall incidental take occur, and applicable definitions and prohibitions under the Endangered species Act of 1969.

BioEnvironmental Associates provided two employee orientation programs to project personnel on the occurrence and distribution of listed species in the project area, measures being implemented to protect these species during project actions, reporting requirements shall incidental take occur, and applicable definitions and prohibitions under the Endangered Species Act of 1969. Appendix F presents a signature page for all Western Geophysical personnel who attended. These issues were reinforced on a daily basis to seismic personnel at start-of-day meetings and in the field.

2. Within 4 weeks prior to commencement of seismic testing activities, a qualified biologist(s) shall conduct preactivity surveys of proposed vibrator and geophone travel paths. During pre-activity surveys, the status of previous surveys shall be reviewed. San Joaquin kit fox dens and kangaroo rat and leopard lizard burrows shall be flagged as necessary, and additional habitat features, if any, shall be identified and flagged as necessary.

Qualified biologists from the BioEnvironmental Associates team conducted preactivity surveys of proposed vibrator and geophone travel paths within 4 weeks prior to commencement of seismic testing activities. Biological resources were flagged with a combination of blue pin-flags and candy-stripe flagging that is recognized by all Western Geophysical personnel to indicate avoidance. Biological monitors preceded vibroseis and geophone crews to ensure travel paths adhered to minimum avoidance distances.

3. Qualified biologists shall accompany seismic survey vehicles and crews throughout the project area at all times that activities with the potential to affect listed species are being conducted. Qualified biologists may conduct preactivity surveys as described above; should aid seismic crews in satisfying avoidance criteria and implementing project mitigation as described in this evaluation; should aid seismic crews in relocating shot and geophone lines as necessary; should observe and note all pertinent information concerning project effects on listed species; and in general should assist the seismic contractor in conducting the proposed project in such a manner as to minimize adverse effects on endangered and threatened species. At least one qualified biologist shall accompany the vibrator crew working within endangered species habitat.

Qualified biologists accompanied seismic survey vehicles and crews throughout the project area at all times that activities had the potential to affect listed species were being conducted, as previously indicated. They observed and noted pertinent information concerning project effects on listed species; and in assisted the seismic contractor in conducting the project in such a manner that minimized adverse effects on endangered and threatened species (see biological monitors compliance notes Appendix C).

4. Pets shall not be permitted on the project site during project activities.

Pets were not permitted on the project site.

5. All food-related trash such as wrappers, cans, bottles, and food scraps shall be disposed of in closed containers only and regularly removed from the project site.

All food-related trash such as wrappers, cans, bottles, and food scraps were confined to project-related vehicles for removal from the site.

6. All spills of hazardous materials within endangered species habitats shall be cleaned up immediately per Chevron's or other land owner's SPCC plans.

Damage to small oil transport pipelines occurred on two occasions (2/9/97 and 4/12/97). Both involved damage to control valves by vibroseis truck travel. In both instances BioEnvironmental Associates team members were present when the spill occurred. Neither spill occurred in sensitive habitat (areas were non-vegetated). There were no oil-related mortalities associated with the first spill. On 4/13/97 (one day after the second spill occurred) a loggerhead shrike was found mired in the oil and was humanely killed. The first spill affected an area of approximately 0.25 acres and the second spill affected an area of approximately 60 ft by 150 ft. Containment involved contacting Chevron Oil Company representatives in the first case, and Texaco Oil Company representatives in the second, to stop the flow of oil at its source. We assisted Western Geophysical staff with berm construction, using hand tools, while waiting for oilfield representatives to respond. Both sites were cleaned by removing topsoil with heavy equipment. For detailed description of clean-up efforts see summary evaluation letters contained in Appendix F.

7. Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset.

Daily preparation needed prior to sunrise, and end of day maintenance was conducted no earlier than two hours before sunrise and not later than two hours after sunset.

8. All project-related vehicles shall observe a speed limit of 20 mph or less on all routes that traverse endangered species habitat, except on State and County highways and roads.

Project-related vehicles observed a speed limit of 20 mph or less on all routes that traversed endangered species habitat, except on State and County highways and roads.

9. Within 45 calendar days after completion to the project, the seismic contractor shall submit to the Service, the BLM, DOE and NPRC a post-activity compliance report that details the following information: dates that seismic testing occurred; pertinent data concerning the seismic contractor's success in meeting project mitigation measures; known project effects on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats, if any (including specific number of dens and small mammal burrows damaged or destroyed); occurrences of incidental take of federally listed species, if any; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats, a summary of rehabilitation plans, if any; and other pertinent information.

Due to the size of this project a large number of biologists were involved (13), and there was a large amount of data collected, both during field surveys and compliance

monitoring. Submission of these data from the project biologists in a form appropriate for presentation to agency representatives, and compilation of this information into an appropriate post-activity compliance report that details the requested information has taken significantly longer than the mandated 45 days after completion of the project.

H. All known and potential San Joaquin kit foxes dens, giant kangaroo rat burrows, and burrows potentially inhabited by blunt-nosed leopard lizards shall be protected by implementing the following procedures. Such protection will help prevent incidental take of dens and burrows in excess of the take limits described above.

1. Project vehicles shall observe travel avoidance routes describe in the biological preactivity survey notes that provide avoidance for sensitive wildlife and special status plant resources, unless alterations to these routes are expressly allowed by the biological monitors.

All project vehicles observed travel avoidance routes described in the biological preactivity survey notes that provided avoidance for sensitive wildlife and special status plant resources, unless alterations to these routes were expressly allowed by biological monitors.

2. To minimize effects of geophone deployment, the applicant shall utilize approved travel corridors along geophone lines to deploy all off-road geophone lines that occur within endangered species habitat. No vehicles other than geophone deployment vehicles shall be used to deploy geophones in such areas. During geophone deployment, work crews shall make every reasonable effort to avoid sensitive habitat areas such as dens, burrows, and cryptogamic crusts. To the maximum extent practicable, geophone vehicle operators shall avoid such habitat areas by 10 feet. One biologist exclusive of biologists observing vibrator crew activities shall oversee the activities of geophone line deployment crews.

To minimize effects of geophone deployment, Western Geophysical crews used approved travel corridors along geophone lines to deploy all off-road geophone lines that occurred within endangered species habitat. No vehicles other than geophone deployment vehicles, except vibroseis trucks traveling between source lines with the assistance of a biological monitor, used such areas. During geophone deployment, work crews made every reasonable effort to avoid sensitive habitat areas such as dens, burrows, and cryptogamic crusts. To the maximum extent practicable, geophone vehicle operators avoided such habitat areas by 10 feet. One biologist exclusive of biologists observing vibrator crew activities oversaw the activities of geophone line deployment crews.

3. All avoidable San Joaquin kit fox dens and kangaroo rat and blunt-nosed leopard lizard burrows within the immediate vicinity of survey routes shall be prominently staked and/or flagged as necessary to alert project personnel to their presence. All project-related flagged shall be collected and removed after completion of the project.

All avoidable San Joaquin kit fox dens and kangaroo rat and blunt-nosed leopard lizard burrows within the immediate vicinity of survey routes were prominently staked and/or flagged as necessary to alert project personnel to their presence. All project-related flagging was collected and removed after completion of the project.

4. The applicant shall make every reasonable effort to prevent the collapse of dens and burrows by relocating source points to avoid dens and burrows or other means as determined to be appropriate.

BioEnvironmental Associates team members and Western Geophysical staff made every reasonable effort to prevent the collapse of dens and burrows by relocating source points to avoid dens and burrows and other means as determined to be appropriate.

5. Project biologists shall keep an accurate and running tally of the number of dens and burrows damaged, destroyed, or otherwise affected by project activities. Such tallies shall be combined and totaled at the end of each work day to determine proximity to take limits and the need for subsequent project modifications to prevent den and burrow effects in excess of take limits. Total number of dens and burrows affected by the project shall be reported in the post-activity compliance report.

6. If damage or destruction to a known San Joaquin kit fox den cannot be avoided during project activities, the BLM, DOE, and USFWS shall be contacted immediately for guidance. Potential kit fox dens that cannot be avoided during project activities may be excavated and backfilled pursuant to Service guidelines without prior notification, provided that excavation is approved and supervised by a project biologist and that such excavation is within incidental take limits provided in the project's biological opinion. Destruction of all kit fox dens shall be reported in the post-activity compliance report.

No take of any listed species was recorded by qualified biologists during project associated activities. Impacts to potential burrows are presented in Appendix C, Table 1. During every seismic project in which BioEnvironmental Associates has worked with Western Geophysical, biological resources have taken priority over location of source points and travel routes. During these several 3D seismic projects there has been no known take of listed biological resources. Western Geophysical has been more than cooperative in this area.

I. The extent of off-road survey routes and other seismic testing areas shall be minimized by implementing the following procedures:

1. Where seismic lines cross threatened or endangered species habitat, the survey corridor within which testing and ancillary vehicles operate shall be limited to a maximum width of 50 feet (25 feet on either side of the center line). These testing activity zones shall be reduced, where possible, to avoid endangered species sites such as occupied kit fox dens or kangaroo rat burrows.
2. Project related vehicles shall be confined to existing primary or secondary roads or to specifically delineated project areas (i.e., areas that have been surveyed and descried in existing documentation). Otherwise, no off-road vehicle travel shall be permitted.

All seismic activities, including testing, that occurred in potential habitat for threatened or endangered species was limited to flagged corridors of to a maximum width of 50 feet (25 feet on either side of the center line). Activity within these corridors was minimized (i.e., travel restricted to centerline) where possible, to avoid endangered species

sites such as occupied kit fox dens or kangaroo rat burrows. All other travel was restricted to existing primary or secondary roads or to specifically delineated project areas.

3. Unauthorized vehicle use of off-road survey routes shall be minimized by implementing appropriate measures to prevent unauthorized entry to off-road survey routes, including placement of gates or fences where these routes intersect existing roads, and posting of signs stating that access is not permitted.

As there was significant off-road recreational vehicle use in many areas of the project site, and considerable interest and curiosity by such recreational users about project-related activities, it was the opinion of BioEnvironmental Associates team members that any device that might draw attention to off-road survey routes might prove more of an invitation than a deterrent. For these reasons measures to prevent unauthorized entry to off-road survey routes, including placement of gates or fences where these routes intersect existing roads, and posting of signs stating that access is not permitted, were not employed.

J. The following general and specific measures shall be implemented to avoid potential adverse impacts to candidate and California species of special concern and their habitats:

San Joaquin Antelope Squirrel - Impacts can be avoided by staying to the flagged route and avoiding the burrows as marked in the field. In addition, a biologist is recommended to assist project related vibroseis and geophone truck cross country travel so as avoid sensitive resources (burrow) and their habitat(s).

Blunt-nosed leopard lizard - The project area is within the known range of blunt-nosed leopard lizards. Project impacts to blunt-nosed leopard lizard habitat could result from habitat being temporarily destroyed (crushed shrubs and vegetation that serve as loafing cover). This type of impact may be lessened by having a flagged route that vehicles shall follow through areas of low density shrubs and other vegetation. Shrubs and burrows shall be avoided to reduce impacts to over-wintering blunt-nosed leopard lizards.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November- February). Project activities will be conducted during daylight hours when lizard activity is optimum. Impacts to this species could result from lizards being crushed by vehicle traffic. In addition, vibration induced collapse of burrows is a low impact potential if avoidance criteria are complied with. Blunt-nosed leopard lizard impacts will be minimized using the following measures:

1. Check surrounding land uses and disturbance for suitable leopard lizard habitat, and
2. Check percent slope, and
3. Check vegetation density, and
4. Check availability of burrows for refuge

Loggerhead Shrike - Loss of foraging and nesting habitat for the Shrike may result if large shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the

seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Le Conte's Thrasher - Loss of potential foraging and nesting habitat for Le Conte's thrashers may result if shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Burrowing Owl - Loss of foraging and nesting habitat for burrowing owls may result as the seismic travel corridor is being used. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Short-eared Owl - This species can fly out of imminent danger, though nesting areas remain vulnerable to seismic travel corridors. Preactivity surveys shall include a thorough inspection of the proposed seismic travel corridor and proposed access travel paths to ensure that nests of this species are not destroyed. Young owls are especially vulnerable to collisions with vehicles, particularly during foraging bouts. Increased disturbance and mortality would lower breeding success, and may cause the owls to abandon the site. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites. The recommended mitigation measures should greatly reduce the potential for impacts to short-eared owls within the project area.

As previously noted these criteria were followed by conducting initial surveys of the flagged drive routes to identify biological resources. Flagged routes were modified in the field to adhere to avoidance criteria. In addition notes regarding resources and modifications to travel routes were supplied to the biological monitors and Western Geophysical personnel (Appendix A & Appendix B). Additionally biological monitors surveyed ahead of both geophone layout crews and vibroseis crews to confirm that reroutes were indeed clear of resources and that no new resources had appeared subsequent to the initial surveys. See Appendix C for biological monitors' field notes on compliance.

K. Vegetation and Habitat Types

1. Project related vehicles shall be restricted to approved travel routes and paths/roads. Large shrubs shall be avoided to minimize impact to wildlife habitat. Large shrubs shall be avoided by carefully selecting travel paths/roads to avoid crushing individuals. In addition, washes represent a fragile habitat type and function as seasonally productive sources of annual vegetation for animals, as dispersal corridors, and as areas affording favorable burrow construction habitat. Washes shall be avoided by vehicular activity as feasible.

All seismic activities, including testing, that occurred in potential habitat for threatened or endangered species was limited to flagged corridors of to a maximum width of 50 feet (25 feet on either side of the center line). Activity within these corridors was minimized (i.e., travel restricted to centerline) where possible, to avoid endangered species sites such as occupied kit fox dens or kangaroo rat burrows. All other travel was restricted to existing primary or secondary roads or to specifically delineated project areas.

Appendices A-C include many notes covering avoidance of large shrubs, especially as they relate to Le Conte's thrasher habitat, and the locations of washes for avoidance, especially as they relate to blunt-nosed leopard lizard habitat.

2. If during any phase of the seismic operation any oil or other pollutant shall be discharged from project related vehicles, or from containers impacting Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of holder to control, cleanup or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

See section G(6) for discussion of oil spill clean-up.

Acronyms Used During the Chevron - Santa Fe Midway 3D Seismic Project

PKFD = Potential kit fox den
KKFD = Known kit fox den
KKFPD = Known kit fox pupping den
PAGSB = Potential antelope ground squirrel burrow
Badger Den = Badger Den
PBNLLB = Potential blunt-nosed leopard lizard burrow
GKRB = Giant kangaroo rat burrow
PGKRB = potential giant kangaroo rat burrow
BOB = Burrowing owl burrow
Erho = *Eriastrum hooveri* (Hoover's woolly-star)
BOL and EOL = Beginning and End of Line
Crypto = Cryptogamic soils
CL = Center Line
RSE or EOR = Road side edge or Edge of Road
ft = feet
PL = Pipeline
ca = approximately (circa)

LITERATURE CITED

California Burrowing Owl Consortium. 1993. Burrowing owl survey protocol and mitigation guidelines. Draft Unpubl. Rpt. by the California Burrowing Owl Consortium. 15 pp.

California Department of Fish and Game (CDFG). 1984. Guidelines for assessing effects of proposed developments on rare and endangered plants and plant communities. The Resources Survey, CDFG. 1 pp.

California Department of Fish and Game (CDFG). 1990. Region 4 Survey methodologies for San Joaquin kit fox, blunt-nosed leopard lizard, San Joaquin antelope squirrel, Tipton kangaroo rat, giant kangaroo rat. Compiled by R. Rempel and G. Presley. 10 pp.

California Native Plant Society (CNPS). 1991. Mitigation guidelines regarding impacts to rare, threatened, and endangered plants. Unpublished manuscript by CNPS - Rare plant scientific advisory committee. 17 pp.

International Association of Geophysical Contractors (IAGC). 1991. Land geophysical operations: Safety manual. Printed by Conoco Inc., Ponca City, Oklahoma. 191 pp.

Nelson, J. R. 1987. Rare plant surveys: Techniques for impact assessment. pp. 159-166. In: T. Elias (ed.), Conservation and Management of Rare and Endangered Plants. California Native Plant Society, Sacramento, CA.

Orloff, S. G. 1987. San Joaquin kit fox survey techniques. Proceedings of a conference on endangered and sensitive species of the San Joaquin Valley, California. Bakersfield, CA. Pp. 185-197.

Tollestrup, K. 1976. A standardized method of obtaining an index of densities of blunt-nosed leopard lizards, *Crotaphytus silas*. Contract 14-16-0001-579RF, U.S. Department of the Interior, U S. Fish and Wildlife Service. unpubl. ms. 11 pp.+ appendices.

U S. Fish and Wildlife Service (USFWS). 1990. San Joaquin kit fox pupping den issues in the Metropolitan Bakersfield Area, Kern County, CA. 4 pp.+ appendix.

U. S. Fish and Wildlife Service (USFWS). 1995. Standardized recommendations for the protection of the San Joaquin kit fox. Advisory notice issued by USFWS, Sacramento, CA. 6 pp. + appendix.

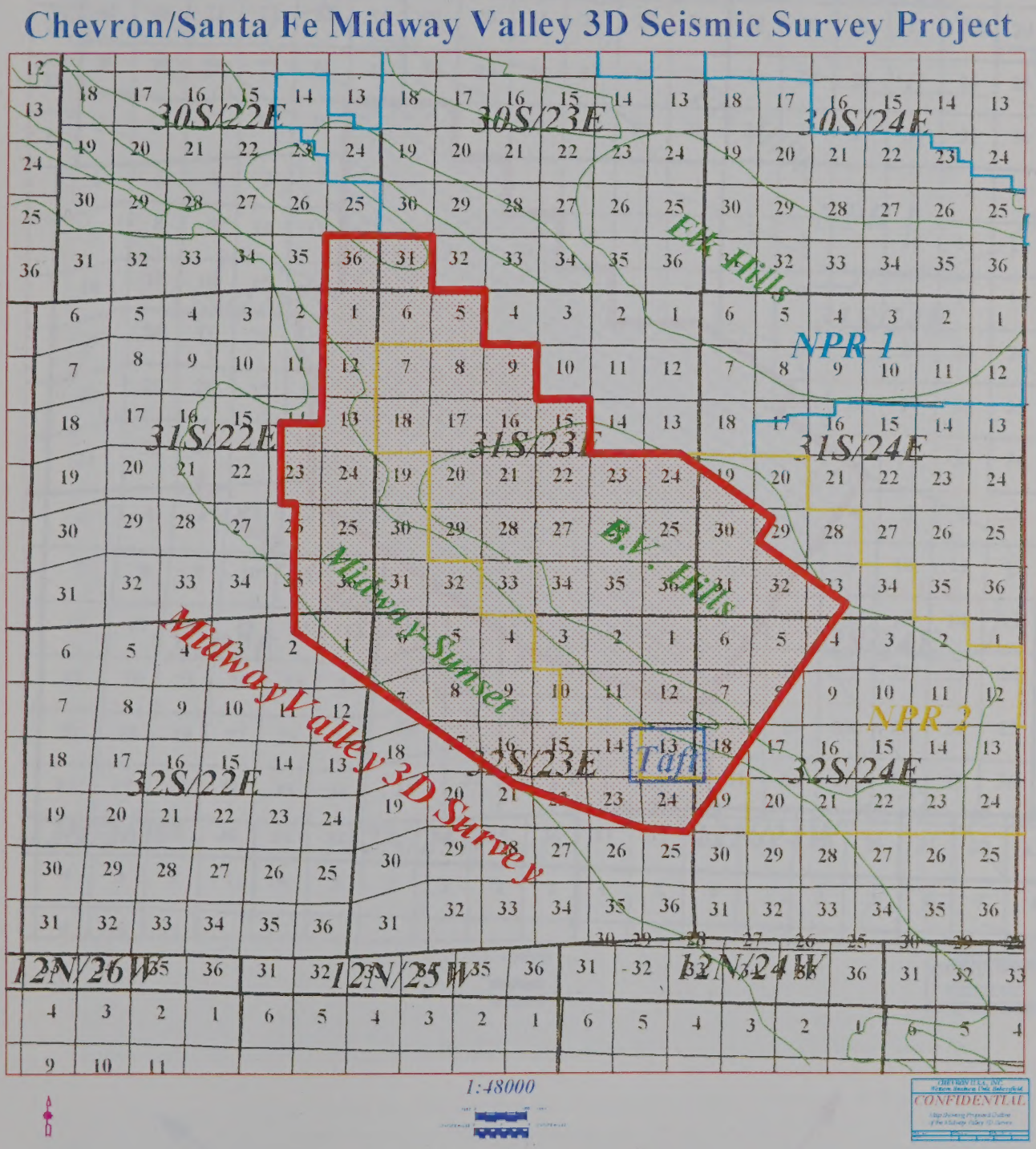

Figure 1. Regional location of the Chevron U.S.A., Inc. and Santa Fe Energy Resources Midway Valley 3D seismic project. The project site included the City of Taft, portions of the Naval Petroleum Reserve #2 (Buena Vista Hills) and portions of the Midway-Sunset oilfield.

Figure 2. Location and direction orientation of receiver (geophone) and source lines within the Chevron U.S.A., Inc. and Santa Fe Energy Resources Midway Valley 3D seismic project.

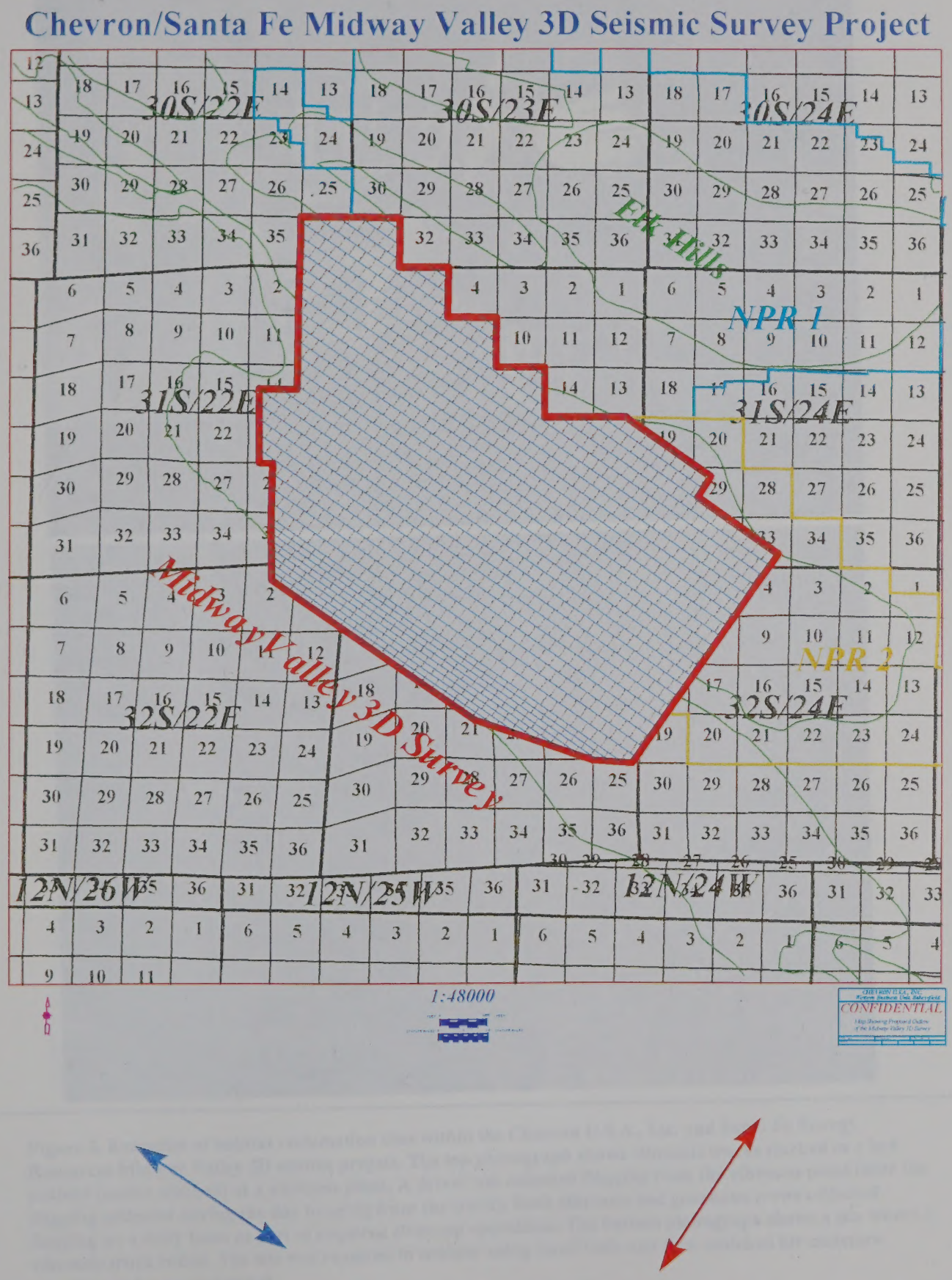

Figure 3. Examples of habitat reclamation sites within the Chevron U.S.A., Inc. and Santa Fe Energy Resources Midway Valley 3D seismic project. The top photograph shows vibroseis trucks stacked in a box pattern (center stacked) at a vibroseis point. A driver has collected flagging from the vibroseis point (note the flagging collected during the day hanging from the truck). Both vibroseis and geophone crews collected flagging on a daily basis as part of required clean-up operations. The bottom photograph shows a site where a vibroseis truck rolled. The site was repaired to contour using hand tools and then mulched for moisture retention and erosion control.

Figure 4. Oil spill that occurred on 4-11-97 from a ruptured control valve on a flow line. The spill occurred in a disturbed area. No listed wildlife or special status plants were impacted. Western Geophysical and BioEnvironmental Associates responded by constructing a berm around the spill while waiting for oifield personnel to respond.

APPENDIX A

GEOPHONE (RECEIVER) LINE SURVEY AND TRAVEL NOTES

Results of biological surveys are presented in this appendix for geophone lines. Avoidance flagging was placed around biological resources to limit vehicular traffic to agency required avoidance criteria. Results are presented by geophone line and station number.

Acronyms Used During the Chevron - Santa Fe Midway 3D Seismic Project

PKFD = Potential kit fox den
KKFD = Known kit fox den
KKFPD = Known kit fox pupping den
PAGSB = Potential antelope ground squirrel burrow
Badger Den = Badger Den
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GKRB = Giant kangaroo rat burrow
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BOB = Burrowing owl burrow
Erho = *Eriastrum hooveri* (Hoover's woolly-star)
BOL and EOL = Beginning and End of Line
Crypto = Cryptogamic soils
CL = Center Line
RSE or EOR = Road side edge or Edge of Road
ft = feet
PL = Pipeline
ca = approximately (circa)

GEOPHONE LINE DRIVE NOTES

Geophone Line 1000

Station 1187 - 1163 - vehicle travel okay on line
1163 - 1164 - coyote den and drainage (avoid by 30 feet)
1164 - 1205 - vehicle travel okay on line
1205.5 - steep drainage and potential AGS burrows - avoid by 30 ft.
potential AGS burrows (2) in bottom of drainage 50 ft. south of 1000 1202, drive around to west too many problems to east. Lines in oil field, habitat very disturbed, terrain very hilly and steep, travel along existing roads and trails.
Habitat - rolling grassland steep only in spots
1261 EOL, habitat rolling grassland
potential AGS burrows 36'S of 1000, 1261 EOL, use existing road
potential AGS burrows 60'S of 1000,256, drive around to E or W.
1246-1241 terrain too steep and brushy for ATVs except for crossing roads.
Potential KF dens ca 60 north of 1000,1236, avoid to west of line.
finish at 1000 1220

Geophone Line 1004

Start at 1004-1263
Potential AGS burrow ca. 54 ft South of 1004 1257, avoid to east or below burrow on slope between 1004 1245 1004 1240, terrain may be to steep for ATVs.
Potential AGS burrow 18 ft South of 1004 1234, avoid to east,flags east of line are 50 ft from KF den which is west of line.
Potential AGS burrows ca. 20 ft South of 1000 1231 - avoid to the west of the Western most burrow
Potential AGS burrows ca. 65' north of 2004 1226, avoid to the east. Finish at 1004 1217
start at 1004 1181 Disturbed very brushy oil field until 1004 1188, then rolling brushy grassland
Barbed wire fence just beyond 1004 1188
2 deep steep washes between 1004 1189 to 10041 1191
KF scat (old) ca. 10' South of 1004 1204,avoid to east of line.
Potential Kf den 45' North of 1004 1211, avoid to west of line .
Potential AGS burrow ca. 65' North of 1004 1215, avoid to West of line
Potential AGS burrows at 1004 1216, avoid to east of line . Finish at 1004 1217
1085 (EOL) - use existing roads and trails through intensely developed oilfield

Geophone Line 1008

Station 1176 (paved road) southeast to 1172
1168-1167 - steep drainage - vehicles use roads and well pads
1149 - 1152 - ATV travel along GPL okay
1150.5 - potential KFD ca. 30 ft E of GPL - ATV travel okay along GPL
1122-1123 - steep drainage - use existing roads and trails
1117-1119 - steep drainage with oilfield developments - use existing roads and trails
1083-1084 - vehicle travel along GPL okay along old well pad (abandoned)
1070 - BOL near pipe storage rack
1216 (road) - 1213.8 - vehicle travel okay along GPL (deep road cut @ 1213.9-1214)
1214-1210 - steep terrain with drainage
1209 - cross fence
GPL travel - use access road @ 1206 - enter line and go N to 1209 @ fence then back-out to 1206
1206-1201 - steep habitat - use existing roads and trails
1201 - 1198.5 - vehicle travel okay along GPL or use adjacent roads and trails
1198 - potential AGS burrow - foot travel along GPL to 1197
1197-1196 - steep terrain - use adjacent road
1196-1193 - vehicle travel okay along line or use adjacent roads and trails
1193 (fence) - 1188 - steep terrain - use perpendicular roads and trails
1183-1176 (located on well pad/RSE) - steep habitat with numerous roads and trails for access
1257.5 - potential KF den in drainage - ATV drive ca. 30 ft N of GPL and then back to GPL

1257.5 - 1255 (road) - ATV okay along GPL
1227 - potential KF pipe den - ATV stay on trail by pin flag
1223 - PAGS @ 123 - ATV cross pipe ca. 30 ft E of GPL
1266 (EOL) - 1262 - ATV okay on GPL

Geophone Line 1012

1058 (BOL) 1173 - steep habitat - and oil filed developments - use existing roads and trails
1173 @ road going N - 1179 - ATV travel along GPL
1179 - 1183 - ATVs okay along line
1183 - potential burrowing owl burrow along RSE (avoid by 30 ft)
1183.5 - PKF/coyote den in drainage ca 30 ft W of GPL - ATVs okay along GPL
1183.7 - 1184 - Crypto soils with Erho - foot travel only
1185-188-1190- crypto soils - foot travel only
1190-1215 (on dirt road) - ATVs okay along GPL1215
Potential AGS burrows ca. 45' and 81' south of 1012 1230, avoid to East of line.
Potential KF den ca 50 ft South of 1021259 avoid to West of line.
Potential AGS burrow (2) ca 25 ft South of 10131260 - avoid to west of line
Potential KF den 96' north of 10121262 avoid to the west of line. Finish 10121269.

Geophone Line 1016

Start at 1016 1272 Coyote den 1016 1267 Too steep and brushy between 1016 1258 to 1016 1256 for quads old well pad at 1016 1258 Burrowing owl and burrowing owl burrow ca. 25'
North of 10161254 ca. 20 West of line avoid 320' East of line Burrowing owl and burrow ca. North of 1016 1247, avoid 50' to East of line. Owl in wash that could be difficult for ATVs
Brushy wash between 1016 1240 to 1016 1241 will impede ATVs.
South of 1016 1217 to 101612 too steep for ATVs.
Between 1016 1208 and 1016 1209 is a steep creek bed.
1016 1203 - 10161 200 too steep for ATVs
1016 1198 - 1016 1196 too steep for ATVs and a deep wash cuts across line
10161195 - getting into steep up and down oil field terrain with steam pipes etc. crossing line.
10161187 - just short of 1016118 - 10161177 - vehicle travel as terrain allows
10161177 - 10161168 is undrivable Finish at 10161168.
Drove south end of 1016 to 1020 in A.M. Start at 10161128
Potential AGS burrow 4' south of 1016 1128, AGS seen near burrow. stay on road East, north and south of burrow.
Arc. site just south of 10161120.
Pipes between 10161119 and 10161118
Pipes between 10161118 and 10161117
Use road between 10161116 and 10161114. Finish at 10161116
1085-1079.5 - ATVs okay along GPL - ATVs enter from well pad by fence and then drive down to 1079.5 (steep wash) and then out on same trail (up to well pad) or travel along existing trail E of GPL to wash crossing and then out to paved road

Geophone Line 1020

1061 - fence start here
1078.5 - PAGS (7) - drive 30 ft to W of line to road at 1078
1080 - wash may be too steep for ATVs dirt road W of line
1082 - two fences with road between them just S
1084 - fenced in area
1085 - pipeline
1086 - fences and road just S
1087 - fence and well pad with pump beyond
1097 - wash too steep for ATVs - drive out to highway and back to geophone line on source line 5097
1101 - pipeline
119.5 - pipeline
1110 - remains of a coyote
1114 - pipeline road, rattlesnake was just S of this station potential AGS burrow just N of road just N drive 30 ft to

E of burrow
1120.5 - PAGS burrows - road and pipeline - drive from road to E of line between 2 blue flags
1129.5 - pipeline
1235 - steep loose slope use existing roads stop at 1237
1274 (EOL)
1273.5 - PKF den ca. 50 ft E of GPL - ATVs okay on GPL
1271 - PAGS burrow - ATVs drive ca. 30 ft E of GPL
1263 - PAGS and Badger den along GPL - ATVs drive ca. 50 ft W of GPL or foot travel
1257 - steep drainage with PKF/coyote den ca 30 ft W of GPL; Erho present on crypto soils at top of drainage bank @ 1256.5 and fence at 1256.2 - ATVs okay up o 1256 and then foot travel across drainage
1253-1254 - Erho a 5-20 ft E of GPL; ATVs drive ca 30 ft E of GPL
1242.5-1244 - steep cliff and wash - foot travel
1226-1228 - Erho - foot travel (steep drainage @ 1226)
1226-1213 - ATVs okay as terrain allows
1213 (paved road) - 1207 (dirt road) - steep habitat and terrain - use existing roads and trails
1208 - PKF den and Erho - foot travel only
1175-1163 - steep terrain and drainage with oilfield developments - ATVs on road - use foot travel
1039 (paved road) - 1037 (4x4 trail) - 1029 - 1028 - annual disturbed grasslands - vehicles okay along GPL as terrain allows (steep wash at 1028)
1061 - fence
1078.5 - PAGS burrows - drive 30 ft W of GPL to road at 1078
1080 - terrain may be too steep for ATVs (dirt road is west of GPL)
1097 - steep drainage - drive out to highway and back to GPL on SL 5097
1114 - PAGS burrow just N of station - drive 30 ft E of GPL
1120.5 - PAGS burrows - drive from road east of GPL between 2 blue flags to 1121

Geophone Line 1024

1218.5 - Erho along GPL - avoid by 20 ft
1218 - PAGSB and badger dig/den ca 30 ft E of line - stay along GPL for avoidance
1214 - okay along line
Deep steep raven at 10241205 coyote Den west of line Fence and road at 10241203
Too steep for ATVs between 10241201 and 10241191 Fence just south of 10241191
small oil field, use existing roads. Drainage at 10241188, too deep and steep for ATVs.
Steep wash between 10241179, too steep for ATVs.
1085 - 1079.5 - ATV okay along GPL - ATV enter from wp by fence and down to 179.5 (steep) wash and the north at on trail or travel along existing trail East of line to wash crossing and to paved road.
1042 - 1078 - steep terrain and oilfield developments using roads and trails.
1101 - use existing roads and trails (numerous oilfield developments)
1024 1178 - beginning of oilfield - terrain to steep and line crossed by pipes, use existing roads. From 1024 1165 - 10241159 - vehicle travel as terrain allows - Stop at 10241159.
Start at 1024 1277 Potential AGS burrow ca 90 North of 1024 1266, avoid to west of line
Potential AGS ca. 60 North of 1024 1266 - stay to west of line steep wash at 1024 1266, drop off too steep for ATVs Potential KF den at bottom of wash ca. 35 west of line between 1024 1257 and 1024 1256 avoid 15' west of line Wash at 10241246 Too rough for ATVs and pipe crosses line just south of station. 6' fence with over hanging barbed wire at 10241233.5, north side of a storage yard.
South side of yard at 1229.5
1019 - 1025.5 vehicles okay along line
1026 - Drive West (upslope) of 1026 by 30 ft (badger den)
1026.5 - 1037 Travel along line
1037.8 - drive 30 ft E of line (badger den)
1038 - 1039 travel on line to paved road
1079 - 71 high road cut at 1082 it can be driven around on old roads
Pipelines at 1103.5 and roads Finish at 1114
1054 - starts a residential area at station
1059 - line offset just beyond use existing roads
1064 - fence just N of
1077 - steep drop off dump N of station in wash old dirt road just S of station usable

Geophone Line 1028

1213 - PKF den just S of 1237, avoid to W of line
PKF den ca 60 ft S of 1251, avoid to E of line
wash at 1276 too steep for ATVs drop off at 1278.5 finish at 1280
1056 - last # point S of it in residential area
1121 - N of this point is oilfield terrain with pipes, road cuts, etc.
Pipeline at 1115.5
Pipeline at 1108.5 Finish at 1079
1079 - midway road
1065 - line runs into residential area just S
1012 - start
1014.5 - PAGS burrows to 1012 avoid by staying on road to W of line
1016 - PKF just S 40 ft W of line avoid 10 ft E of line 1016
1018 - PAGS just N avoid 30 ft to e from 1018.5 to 1017.5 stop at 10281024
1213-1212 - use existing roads and trails
1213-1203 - ATVs okay along GPL or use adjacent parallel steam line rad ca 0-50 yards W of GPL
1203 - 1199 - foot traffic - fence @ 1201; BO burrow and PKF den @ 1200.5
1199 (dirt road) - 1197 - (Barn owl burrow in side of wash bank) - use existing roads and trails
1195-1184 - ATVs okay as terrain allows
1184.5 - PAGS burrow and PKF/coyote den - foot traffic only
1184-1180.5 - ATV okay as terrain allows
1180 - PKF den - ATVs drive 30 ft W of GPL and then back to GPL
1179.5 - 1175 - ATV travel okay as terrain allows
1175-1172 - CalResources (SWEPI) equipment yard and offices
1169.2 - PAGS burrow and Badger den/dig - foot traffic or drive 30 ft E of GPL
1168.8 - steep terrain - ATVs use adjacent road W of GPL to gain access to top of hill and then drive into line @
1168.8-1157 (Midway Road) - ATVs okay along GPL as terrain allows and oilfield facilities permit
1024-1025.5 - okay on line
1025.5 - 1026.2 - drive E of GPL (PAGS)
1026.2 - ATVs drive online - avoid badger den by driving 30 ft E of GPL
1026.2-1028.5 - okay on line
1028.5 (roads)-1032 (steep wash @ 1031.5)
1032 (adjacent road 0-20 yards W of GPL) - 1038 (@ paved road) - okay on line or use ATV trails a 100 yards W of GPL
1038 (paved road) - edge of Taft City - use adjacent roads and trails which are numerous

Geophone Line 1032

1283 - EOL
Line next to paved road on E side crosses road at 1277
Line next to paved road on W side at 1269
Between 1276 - 1269 is so close to road anyway it might be faster to keep line along road ?
Beginning oilfield type terrain at 1265 with pipelines road cuts etc. crossing line moving away from paved roads at this point stay one existing roads where possible until 1248
PKF den at 1262.5 line is just E of existing dirt road stay on road with geophone lines
Pags burrow at 1245.5 avoid 30 ft W of line
Terrain gets bad again at 1243 foot traffic and /or stay on existing roads until
ATV travel possible from 1228 to 1217 - 1211 (3 in pipeline on ground)
1210.5 - steam pipeline but drive around to nearby roads possible
1203 - school just N of 1202 - fenced in - no easy access - off setting line to E may be feasible
1200 - deep steep wash just S too steep for ATVs fences on S side of wash starting at 1198 end at 1197.5
1197 - fenced pasture between 1197 - 1196 pipeline at 1196
1193 - fence just S
1184 - Pipeline and dirt road pipeline and dirt road are somewhat parallel to line in this area
1181 - paved road
1179 - paved highway
1180 - PAGS burrows stay on existing road just W of line and metal fence painted yellow

1174 - Paved road
1173 - wash just N of 1173 too steep for ATVs
1173 - PKF in wash avoid 50 ft to E or offset to dirt road 75 ft to W
1169 - Pipeline and road around to W available
1165 - wash too steep for ATVS
1162 - road cut too steep for ATVs paved road just S of station
1120 - oilfield type terrain S of this station use existing roads
1138.5 - several pipes that are PKF offset line W side of existing road
1136 - fence just S
1109 - steam pipeline and dirt road no obvious way around
1108 - pipeline
1090 - fence just S dirt road at fence turns S near station
1089 - drive around fence
1078 - ditch
1077 - steep wash and a lot of broken glass on slope ATVs are not advised (may be arc area) stop at 1061 residential S of this station
1043 - steep drainage - use existing roads
1042 - steep wash use existing roads
1033 wash use existing roads to bypass S side too steep for ATVs
1030 - fenced in Water Dept area drive around to E of line
1018 - 1013 wash and broken ground may need to use existing roads that closely parallel line stop at 1005 BOL

Geophone Line 1040

1288 (EOL) - 1265.5 well established easements - avoid pipes and machinery ad needed using existing roads
1265 - habitat begins
1264.5 - steep wash - travel E at 12 ft to avoid drop off (if needed) otherwise stay on line
1260.5 - Hwy intersection stay on line well established roads up to 1251.5 use existing roads to avoid pipes etc.
1251.5 - Habitat starts again (eagle flies over) held up in some palms to the W) stay on line
1249 - use E side to avoid pipelines
1245.5 - Hwy
1241.5 AGS burrow SW of green striped pole at 12 ft from pole veer to the W to avoid peck up line again off of oilfield road watch for 2 3/4 in. metal pipeline at 1241.5 next to 1241 station use roads to avoid
1240.5 - pipeline avoid by using existing roads stay on line
1238.5 use roads to avoid 2 pipelines 4 in
1238 - stay on line up to
1233.5 - paved road intersection
1233 - habitat starts again and continues across paved road at 1227.5
1222.5 - cross paved road
1219.5 - next to station 1219 use existing roads to avoid pipeline
1216.5 - parking lot (urban area)
1215.5 - vacant lot/field picks up again maneuver at fences as needed
1211.5 - Paved road
1211 - all residential EOL
1211 - 1196 residential area (use available roads and trails as needed)
1196 - 1194.5 use roads and trails as needed to avoid pipelines and obstacles
1192.5 - 2 steam lines
1190.5 - pumpjack
1189.5 - 8 in pipe suitable as PKFD - avoid by using a 50 ft perimeter either side as needed and 50 ft up the line
1179.5 - 1188.5 maneuver to either side as needed
1187 - steep banks and numerous pipes - trucks may be limited - if so use road to SW possible N
PAGS burrows at 1186.5 on steep banks 20 ft from GPL (veer to the E 10 ft and 30 ft up the line
1185.5 - maneuver as needed
1184.5 - trash pile with colored glass bricks relics avoid possible *Neotoma* midden at 1182.5 (use road to SW to avoid) two 8 in pipes suitable for KF at 1181.5 20 ft to E of GPL 1040 avoid by moving 30 ft SW of GPL and up the line 50 ft
1181 - 1178 steep banks pipes etc. maneuver at as needed
1178 - 1175.5 (tool yard) move about as needed

pipelines - use road 8o ft SW of line if needed
1168.5 use road to NE at 50 ft stay on line up to 1166 PBNLL burrow
drainage/arroyo cross if possible if not use road at 50 ft to SW at 1165.5
1164.5 use road to NE
Big drainage ditch at 1159 use road to NE if needed
1149.5 use any route desired
1145 - PAGSB - potential access to the S at 30 ft
1143 - truck OK
potential Ammo den in the center of GPL at 1141.5 at 10 ft W of paved road veer to S to avoid
1140.5 (6 ft) avoid as needed
1139.5 K-rat burrow use existing roads to avoid OK up to 1129.5
1129.5 - PAGSB - maneuver at brush to the NE
1128.5 - badger burrow (in arroyo)move to NE 30 ft and up GPL 30 ft trucks
K-rat burrow in arroyo at 1126.5 veer to SW 30 ft and 30 ft up line
K-rat burrow use existing road 1124.5
conglomerate face at 10 ft tall with various burrows avoid by traveling NE 20 ft at 1121.5
1120.5 - K-rat burrows veer SW 35 ft to avoid stay to the E of any wire at 1113.5
1112.5 - PAGSB - use existing roads to avoid
potential K-rat burrow at 1110.5 use roads and trails to avoid
1106.5 K-rat burrow avoid by using roads to SW at 50 ft
between 1106.5 and 1083.5 - numerous oilfield equipment, pipes, drilling rig etc. - terrain heavily used - good habitat for listed species but no burrows - move about as needed
1083.5 - multiple badger burrows veer to E 50 ft and 50 ft up GPL
1076.5 - badger burrow 20 ft NE of GPL veer SW 30 ft and 50 ft up GPL
1061.5 - avoid gopher dens as best as you can move W to avoid
trucks OK up to 1057
GPL 1040 - 1020 trucks OK use existing trails and roads
cross Hwy marker at 1016
1012 use road to NE if needed
1000 numerous gopher burrows - try and avoid as much as possible
1005.5 - PAGSB - use road to the W at 90 ft or move over 50 ft to W and 50 ft up GPL
1004 - 1003 many dens/burrows - need monitor in this area (probably CGS burrows)
1003 - use roads / trails up to BOL
1001.5 - plastic pipes

Geophone Line 1048

1294 (EOL) - 1285 - intensive developed oilfields - use existing roads and trails
1284 - Drive SW along steamlines 10 ft (PAGS burrow in adjacent habitat)
1277 - use road that is E (that intersects with SL) Come back onto GPL trail at flagged power poles to station 1275 - continue N of GPL 1048 to steam lines at station 1274
flagged areas indicate potential AGS burrows (trucks may drive down S side of pipe to get back to GPL (use S side for access)
1274-1272 - vehicle travel along line okay
1272 - trucks E to road to cross over pipelines - use existing roads and trails up to 1266 (avoid PAGS burrows by following flagging close to GPL)
1262-1259 - travel along the GPL okay - avoid shrubs as feasible
1259 - travel around trash pit - stay between flags that are 20 ft SW of GPL
1259 - cross drainage between flags - go back to GPL and follow line
1258.5 - follow road E to pipelines - take existing road south to intersect GPL at 1235
1235 - enter line and drive back along line to pick up stations 1257 and 1256 - travel along line okay
1254-1252 - Drive 30 ft E of flagging to avoid PAGS burrows
1252 - Travel E to pass pipes and to avoid pipelines - travel along paved road SW to pick up line - travel along line okay
1251-1236 - use existing roads and trails - numerous PAGS burrows and pipelines
1250 - may have to go to road crossing and backtrack to drainage past 1244
1241 - Active AGS burrow at flagging on E side of road at pipe crossing (past 1241)
1236-1226 - inside oil companies work yard
1226 - 1221 - stay on ridge W of GPL - at 1221 follow flagging W to cross pipes - follow existing roads and trails

1221-1207 - use existing roads and trails
1207 - use existing roads drainage ditches and flagged PKFD at 1206 foot traffic only
1205 - 1286 - use existing roads avoid flagging by 50 ft E
1204 - 1202 follow paved road and oilfield roads because of pipeline
1202 - 1198- cross country trail between oilfield roads is OK
1198 - 1180 use existing roads to avoid potential burrows
avoid PAGS burrows trail on line OK
1179 - 1177 travel cross country OK avoid flagged area use oilfield roads when possible
1177 - drive 30 ft SW of flagging to avoid K-rat burrows OK back to line
1175 drive 30 ft SW of flags
1175 - 1172 use oilfield roads
1175 - 1170 cross country OK (avoid pipes) at 1170 drive E of line -
cross drainage between flags only then back to line at 1169
1169 - avoid P burrow drive 30 ft W of line then back to line at 1168.8
1168.8 - 165.5 cross drainage between flags then back to line
1164.7 - 1160 back on line trail OK at 1160 go E to road
Pick up line at 1159
1159 - 1148 travel along line at 1147.9 travel 30 ft E of GPL and then back on line at 1147.7
1147.7 - 1145 travel on line OK at 1145 drive back to road to cross drainage
1145 - 1141 use existing roads
1141 - 1138 use existing roads 11365 stay directly on line to cross drainage
1136 - 1134 travel along line OK at 1134 trucks must go back to last road and then travel W to cross large drainage
come back E to intersect GPL at 1133
1133 use roads and trails back to GPL at 1131
1131 - 1128 travel along GPL OK
1128 - cross drainage 15 ft W of line
1128 - 1026 travel OK along line owl in cavity above road (band) 75 yds W of line at 1126
1026 - trucks stay 20 ft from flagging PAGS burrow cross drainage 50 ft E of GPL and then back to line at flags
(1125)
1125 - back on GPL at flags
1124.5 drive truck 30 ft E of line (PBNLL/K-rat burrows)
back to line at 1124 - 1126.5 OK on line at 1122.5 travel W of line 50 ft to (road drainage and avoid flags - PKFD
GPL 1048 back to line at 1122
1122 - 1121.2 avoid flags travel 30 ft E (K-rat burrow)
1120.5 - E of line PBNLL burrow
1115.5 - 1120 OK on line at 1115.5 travel NE 75 ft to cross drainage then back to line at 1115
1115 - 1111.7 travel along line OK at 1111.7 travel 30 ft NE of flagging K-rat burrows
1111.2 trucks NE 30 ft of line K-rat burrows back on line at 1110.8 cross drainage at 1110 S of line 50 ft from
flagged PBNLL burrows back to line after drainage
1109 - 1107.2 on line OK (road intersection and pipe at 1107.2)
1107 - from road back on line OK use GPL and existing roads when necessary
1107 - 1102.2 travel on line OK stay N of line 20 ft at flagging at 1102.2 then back
to line at 1102
1102 - 1099 travel N road OK at 1044 - go back to road and go E to oilfield road then S along road to line - trucks
may go back up line to get 1098
back on line OK
1095.5 - stay 30 ft SW of flagging PBNLL burrow - then back on line OK
1095.7 back to line
1094.5 stay 30 ft SW of line PBNLL burrow - cross road and back on line OK
1094 - 93 drive in line OK
1092 - 1086 fence in area stay on existing roads and trails
1086 - 1076 residential areas GPL runs across pastures and yards stay on existing roads
too dark to finish last night. start at 1062 and go W on line at 1062 - trucks travel 1062.9 on line OK at 1067.9
truck must travel 50 ft N of line to avoid PAGSB - reenter line at orange flagging
1063 - 1066 use existing roads and trails flagged K-rat burrow along line
1066 - trucks go SW on road and cross drainage stay on road
1067 - 1068 shrubby stay on line
1069 - 1074 oil tanks (fenced in) drive W along fence and follow finish around to 1074
1074 - 1079 stay on roads and trails

1074 - 1014 residential area stay on roads and trails
1013 - 1006 oilwell and tanks stay near roads and trails (trail N of line 20 ft travel OK between 1013 - 1014)
1004 -1006 Arch site - unmarked no bio resources 50 ft S of line
1003 - 1004 truck on line OK avoid shrubs
1001 avoid flagged PBNLL burrows - No vehicle travel within 30 ft stay on roads and trail
1003 - 1000 (EOL) not on stake travel on existing roads

Geophone Line 1056

1299 (EOL) - 1288 - 1273.5 (paved road) - oilfield developments (pipelines, tank sites, etc.) -vehicle travel use existing roads and trails
1273.5 - vehicles drive between flagging (K-rat burrows)
1273.5- 1269 - 1260 - okay on line
1259 - PBNLL burrows - foot traffic only (steam line along edge of wash)
1259.5 PKF den (pipe) tagged with wooden stake labeled 25A-6 on metal tag. Den is on NW slope of old abandoned sump berm
1257.5 - Le Conte's thrasher ca 70 yards W of GPL at 1257.5
1256-1247 - vehicle travel along GPL okay
1242.1 - 1242 - pipeline and K-rat burrows, PKF den - foot travel only (park on existing pipeline road)
1242-1238 - (well pad) vehicles along line okay
1226.9 - PKF den (pipe) foot travel and use existing roads
1224.5 - K-rat burrows - use adjacent roads and trails
1219 - permanent wooden stake marker
1219-1196 - (Midway Road W of Highway 33) - vehicle travel okay along GPL
1195 - (S side of Midway Road and just E of Fellows) - 1187 - vehicle travel on line okay
1187.2 - vehicles drive W 30 ft of Line between bio flags to avoid Krat burrow and badger den/dig and then back to line @ 1186
1185 - Arch site
1185-1166 - Drive W of line 30 ft - PAGS burrow
1166.5-1152.5 - plowed and disced ground - (CGS burrows) - okay on line
1152-1131.5 - use adjacent road that is ca 0-50 ft W of GPL
1131.5 (road) - 1131-1130.5 - steep wash/drainage
1130-1107 - use adjacent rad that is 0-10 W of GPL
1122 - PKF den in excavated pit around pipeline valve - foot travel only or use adjacent road W of GPL
1098 - steep wash - use existing roads and trails around wash and then drive into line at 1098.5
1087 - fenced facility - use perimeter fence road
1087-1107- vehicle travel okay cross country as terrain allows
1087 (fenced facility) -1060 - GPL traverses oilfield storage yards - vehicles use adjacent roads and trails
1060 (Harriett Street in Taft) - 1008 - vehicles use roads and trails through Taft
1008-1000 (BOL) - use existing roads and trails (1007.5 - Highway 33/119)
1007-BOL - ATV trails and paved road adjacent to GPL (0-50 yards from Line)

Geophone Line 1064

1064 1002 - PAGS burrow 15' E of Station, move Station 15' W and follow flags to avoid by 30'.
1064 1017.5 - Deep wash, very shrubby area.
1064 1022 - Hospital parking lot N of this point.
1064 1056 to 1064 1062 - Shrubby area with wash in middle.
1064 1247.5 - Pipeline crosses line, can drive around on vague existing rd.
1064 1250.5 - Fenced in yard, could not gain access, yard is mostly bare ground with some grass.
1064 1266 - PAGS burrow 15' N of station, move station 15' S to existing rd., follow flags to avoid by 30', Pipeline and rd. about 20' N of station.
1064 1266.5 - Pipeline crosses line.
1064 1269 - Le Conte's thrasher observed near line avoid large shrubs in this area.
1064 1272 - PAGS burrow 31' N of station, follow flags to E to avoid by 30'.
1064 1274.5 - Pipeline crosses line, Oil Field in this area with many pipelines, etc., use existing rds. where possible.
1064 1282 - Pipeline crosses line.
1064 1284.5 - PAGS burrow, follow flags to W to avoid by 30'.

1064 1288.5 - PKF burrow, follow flags to avoid by 50'.
1064 1289 - Pipeline crosses line just N of station.
1064 1291 - Pipeline crosses line just N of station.
1064 1301 - Pipeline crosses line just S of station, existing rds. available to drive around.
1064 1306 - Pipelines with rd. in the middle crossing line.
1229.2 - PAGSB - drive 30 ft W on Road
1223 - stay online to avoid flagging E and W of Line (PAGSB)
1221.5 - stay online to avoid flagging E and W of Line (PAGSB)
1213.4 - PKFD (inactive - grass, etc. in entrance) - Drive 50 ft W of line
1168 - S side of Henry Road
1135 - on RSE
1140-1140.5 - Numerous PAGS burrows - follow flags W of line (probable arch site)
1150.2 - PKFD - avoid by following flagged route E of line with 50 ft avoidance
1151.5 - Drive around steep drainage by following flagged route on Ag lands
1156-1156.5 - PKFD - follow flagged route W to Ag lands
1106-1135 - no resources - vehicle travel okay along line as flagged
1092 (high voltage lines overhead) - 1106 - no resources - travel along line okay as flagged
1064 - Lincoln Street in Taft
Lincoln Street in Taft - 1058 - This portion of the GPL follows a portion of Sandy Creek Wash that is full of rip rap - numerous tracks of KF, scats, etc. No KKFD or PKFD observed. From 1058 - Lincoln Street - use foot travel and stay close to soccer fence
1059-1060 - walk cable through
1062 - additional hummers
1064-1062-1069 - Mobil fenced yard
1069 - No resources

Geophone Line 1072

1000(BOL)
1072 1006 - Deep wash.
1072 1014.5 to 1072 1017 - Taft Airport, fenced on both sides but access available.
1072 1248 - Pipeline crosses line.
1072 1253 - PAGS burrow about 12' W of line, follow flags to E to avoid by 30'.
1072 1258 - Fence on N side of Hazardous Waste area, line offsets around area, stay on existing along fence if possible.
1072 1266.5 - Pipeline crosses line.
1072 1272 - PAGS burrows just S of this station, move station 30' N, pipeline crosses line just S of burrows, follow flags to W or use existing rds. to avoid by 30'.
1072 1276 - Pipeline crosses line.
1072 1280 - Occupied AGS burrow just S of station and 25' E of line, follow flags to W to avoid by 30 ft.
1072 1280 to 1072 1282 - Large reservoir at least 30' deep with ramp into it.
1072 1282 - Burrowing Owl burrow (flushed owl), follow flags to W to avoid by 50'.
1072 1283 - Deep wash.
1072 1289 - PAGS burrow 20' S of station, move station 10' N, follow flags to W to avoid by 30'.
1072 1300 - PAGS burrow 20' W of line just N of station, follow flags to E or stay on existing rds. to avoid by 30'.
1072 1291 to 1072 1304 - Oil Field area, mostly none habitat, follow existing rds. if possible.
1072 1311 - PAGS burrow just S of station, move station 20' N, follow flags to W to avoid by 30'.
1072 1311 - Pipeline crosses line just N of station.
1072 1316 to 1072 1322 - Oil Field area, mostly none habitat, follow existing rds. if possible.
1172 - SW corer of Henry Road and Midway Road
1201.3 - AGS sighted under shrub (PAGSB present) - drive E through beak in shrubs
1231 - end of survey
1148.8 - Several coyote size dens that serve as PKFD - drive along flagged path W of line
1135 - PAGS burrows east of line - follow travel path flagged to the W
1134.5 - PKFD - continue travel to W along flagged route
1131 - end of survey
1104-1096 (high voltage lines overhead) - no resources - travel along line okay as flagged
1097-1079 - travel along line okay as flagged
1094.5 - large covet of quail

1079.7 - PAGSB - use adjacent road or follow flagging W to cross road
1068.1-1065 - several Hummers observed in this area and vocalizing - possible migration
End survey at Lincoln Street in Taft

Geophone Line 1080

1000(BOL)
1003 - wash, could be too steep for ATVs.
1005 - Cable fence crosses line.
1015 - N side of Taft Airport, chainlink fence, access available, airport mowed on a regular basis between 1080 1015 and 1080
1005, CA ground squirrels present.
1015.5 to 1019 - Line runs along fence here, houses S of line.
1016 - PAGS burrow 9' N, follow flags to E or stay on existing rds.to avoid by 30'.
1019 - Fence crosses line.
1024 to 1069 - buildings and urban area S of this point.
1070 to 1084 - OK on line.
1085 - Wash, too steep for trucks and for ATVs
1086 to 1110 - OK along line.
1110.5 - PAGSB, drive 30 ft to E of line
1115 - Wash, could be OK? for ATVs, trucks, will have problems
1116.5 - Road and pipeline, pipeline goes underground for ca. 30 ft. E of line allowing vehicle crossing
1120 - Road with drainage ditch on S side to deep for truck but OK for ATV
1128 - Road and pipeline
1128.5 - Wash, coyote den off line to E
1131-1132 - PAGSB - follow flagged route 30 N of line
1132 - vehicle travel along line okay
1137.3 - PKFD/coyote den - avoid by 50 ft.
1139 - Noise test layout occurred from 1139 - to the edge of Taft City
1147.5 - raven/raptor nest on utility pole (2 red-tail hawks observed foraging in this area)
1167.7 - coyote tracks and scats, KF scats
1173 - PKFD - pipes flagged for avoidance - use travel path flagged E of line
1173.5 to 1200 - no resources - travel along line okay as flagged
1200 - Pipeline crosses line.
1208 - PAGSB 18' S of station and 3' W of line, avoid 27' to E of line
1213 - PAGSB 45' S of station and 5' E of line, avoid 25' to W of line
1218 - Pipelines cross line.
1219 to 1275 - no resources - travel along line OK
1261 to 1275 - Oil Field area, mostly no habitat, stay on existing rds. where possible.
1277 - PAGS burrow 6' W of station, move station 30' S and follow flags to E to avoid by 30'.
1278 to 1303 - no resources, travel on line OK
1304 - PAGS burrow about 50' N of station, follow flags to W to avoid by 30'.
1309 - PKF about 8' SW of station, move station 45' N, follow to E to avoid by 50'.
1315 - Wash and crossing pipeline just N of station.
1317 to 1326 (EOL) - Oil Field area, use existing rds where possible.

Geophone Line 1088

1001(BOL)
1007 - Pipeline crosses line.
1010.5 - PAGS burrow, follow flags from 1088 1010 to 1088 1011 to avoid by 30'.
1013.5 - 2 lane paved rd. with fences on both sides.
1019 - Line runs next to deep wash in this area, station is in the wash and the rest of the line is above the wash.
1021 to 1030 - Line in and out of deep wash, recommend staying out of wash with cable if possible.
1031 - Fence and main rd., large opening in fence.
1031 to 1070 - Residential area.
1070 to 1084 - OK on line.
1084.5 - steep wash, existing rds. available if ATVs can't cross.
1097 - PAGS and PBNLL burrows approx. 27' N of station, move station 10' S or W, follow flags to avoid by 30'.

1103 - Le Conte's thrasher seen near this point, avoid large shrubs in this area.
1109 - overhead electrical lines
1119.5 - PAGSB along RSE E of GPL - stay along line as flagged for avoidance
1120-1128 - okay along line as flagged
1126 - vehicle travel onto dirt road and around to line at 1125
1128.5 - PKFD - drive 50 ft E of line for avoidance
1129 - okay along line as flagged
1131.2 to 1136 - Ag land - travel along GPL okay as flagged, barn owl roosting inside covered sump pit (probably in drain pipe) at SE corner of the Ag field
1176.9 - PKFD - follow flagged route E of line for avoidance
1177.5 to 1200 - OK along line
1201 - PAGSB 50' N of station, avoid by 30' to W.
1206 - PAGSB 25' N of station, avoid by 30' to W
1210 - Fence crosses line.
1215.5 - Fence crosses line.
1218 - PAGSB 25' N of station, more burrows E of line, avoid 45' E of line.
1221 - Pipeline crosses line.
1230 - PAGS burrow 30' S of station, follow flags to E to avoid by 30'.
1252 - PAGS about 25' and 18' S of station, move station 12' N, follow flags to W to avoid by 30'.
1262 - Le Conte's thrashers observed near line, avoid large shrubs in this area.
1265.5 - PAGS 10' W of line, follow flags to E to avoid by 30'.
1272 - Burrowing owl burrow 12' E of line, move station 50' S or N, follow flags to W to avoid by 50'.
1282 to 1298 - Oil Field area, mostly no habitat, use existing rds. if possible.
1303 - Pipelines crossing line.
1305 - Wash, may be difficult to get through with ATVs.
1320 to 1331 - Oil Field area with very little habitat, use existing rds. where possible.

Geophone Line 1096

1000 - BOL
1003 - drive 50 ft either side of flagging then back to line at next flag avoid burrow as flagged
1011 - Old AGS carcass otherwise travel along line OK
1011 to 1012 - road
1012 - travel along line OK
1016 to 1017 - Drive 30 ft W of line to avoid AGS burrow
1017 to 1024 - Avoid burrow as possible drive on line OK
1024 - road
1024 to 1027 - Horse Stables
1027 to 1036 - Use existing roads and parking areas
1036 to 1053 - Residential area
1053 to 1055 - OK on line
1055 to 1078 - Residential area
1084 - PKFD 30' N of station, follow flags W to avoid.
1085 to 1136 - OK on line.
1136.5 - arch. site
1137.5 - Pipeline
1147.5 - PAGSB, travel 30 ft S of line as flagged
1148 to 1165.5 - travel along line OK as flagged
1166 - KKFD, follow flagged route 75 ft S of line
1167.5 - Pipeline and PAGSB - follow flagged route 20 ft S of line
1175.5 - PAGS, moved to N 25 ft
1176.5 - PAGS, moved to W 30 ft.
1181 - PAGS, moved to N 30 ft
1185.5 - PGKRB, move line 30ft N
1189.1 - PBNLLB, move line to road 0-20ft away
1199.9 - PGKRB, move line W 30ft
1206 - PGKRB, move line 30ft N
1216 - PBNLLB, move line 30ft N
1217 to 1298 - OK on line.

1299 - deep drainage, cross drainage 100ft W line
1302 - drainage, cross 100ft E then back to GPL
1302 to 1320 - Travel cross country on-line OK, use existing roads when possible
1320 - PAGSB, stay on road to avoid.
1320 to 1337(EOL) - Oil Field, use existing roads and trails

Geophone Line 1104

1000(BOL) to 1005 - travel existing roads and trails
1005 - fence
1007 - PKF den, follow flags 50 ft S of line (OK by 50 ft on line otherwise)
1009 to 1011 - travel along line OK
1011 to 1013 - use road
1013 to 1021 - cross country OK on line
1021 to 1031 - use roads trails parking lot and cross country OK as needed
1031 to 1036 - travel S of line on old roadbed 10 - 30 ft from line
1032 - drainage, drive cross country as necessary and use road to N if possible
1036 to 1052 - Travel roads and trails N of line when possible
1052 - Fence crosses line.
1054.5 - Badger den and PKFD - follow flagging for avoidance (50 ft W of line)
1055 to 1057.5 - Follow flagging for avoidance S of line
1058 to 1070.5 - Travel along line OK
1071 to 1081 - Fenced Mobile yard
1081 to 1154 - OK on line.
1155 - PBNLLB, follow flags to N 40 ft
1156 - Pipeline
1169 - PAGS, follow flags to N 30 ft
1172 - PAGSB, follow flagged route 30 ft N of line
1172.8 to 1177 - travel along line OK as flagged
1177 to 1185 - travel along line OK
1186 - PGKRB, follow flags 20ft N
1192 - PAGS burrow, follow flags 30ft N
1197.5 - PAGS burrow, follow flags 30ft S
1203.5 - PBNLL, follow flags 30 ft N
1210 - PBNLL burrow, follow flags 30ft SE
1216.1 - PBNLL burrow, follow flags 30ft SE
1217.5 - PAGS burrow, follow flags 30ft SE
1227.5 - Badger den/PKFD, follow flags 10' S
1231.5 - Badger/PKF burrow, follow flags 50ft SE
1232 - Pipeline
1274.5 - PBNLL burrow, follow flags 30ft S
1275.8 - PBNLL burrow, follow flags 40ft S
1292.5 - Badger/PKF den, follow flags 50ft S
1304 - pipeline
1308 - Wash
1317 - Wash, move line E to road
1325(EOL)

Geophone Line 1112

1008(BOL) - OK for trucks to Hwy.
1012 - Pipeline, move to N if needed to avoid
1018.5 - PAGS, Stay on road to the N at 30 ft and 30 ft up GPL
1019.5 - Pipeline, use roads if needed
1020.5 - PAGS, move to either side 30 ft and up GPL 30 ft
1024 - cemetery
1030 to 1033.5 - Pipeline crosses line
1033.5 - Pipelines(2) cross line
1034 - Pipelines(2) cross line

1041.5 - Pipeline crosses line
1045 - Pipeline crosses line
1047 - Pipeline
1052.75 - Pipeline
1059.75 - PAGS, follow flags S 30 ft
1066 - PAGS, follow flags S 10 ft
1067 - Pipeline crosses line
1070.5 - Pipeline (1/3 buried) crosses line
1075.5 - Badger den and PAGS follow flags to S
1080.5 - Pipeline crosses line
1082 to 1096 - Use roads and trails where possible - or online travel OK
1096 to 1100 - Use flagged trails and existing roads or travel along line OK as flagged
1100 to 1132 - Use flagged trails and existing roads or travel along line OK as flagged
1132 - Cross country OK
1134 - Drainage - Cross 10 ft NW of line
1135 - 1173.8 - Travel along line OK as flagged
1173.8 - Drive 30 ft W of line (PAGSB)
1174 to 1179 - Travel along line OK as flagged
1179 to 1181 - Oilfield - use existing road and trails
1182 to 1225 - No resources found.
1225.5 - PAGS, drainage with steep bank. follow flags 30ft E
1226.5 - PGKRB, follow flags 30ft W
1229.8 - PGKRB, follow flags 30ft E
1230 to 1240 - Travel on line OK.
1240 PKF den 25' S of line
1241 road
1243 PAGS burrows on line
1245 road
1246 road
1246.2 Badger dig 5' N of line, too small for KF
1249 Arch site. PKF den in arch site
1250 road
1250 sump
1250.25 pipeline
1252.5 road
1257.75 PKF den 25'E of 1258
1271 sump, with road around
1272 Arch site
1274 Arch site
1276 road, pipeline. On line OK
1277 wash, too steep for trucks
1280 road
1284 road
1291.5 pipeline
1300 pipeline

Geophone Line 1120

1000(BOL) to 1003 - trucks OK on line
1003 - Pipeline crosses line, ATV or foot travel to 1004.5
1005 to 1010 - Trucks OK as oilfield developments allow (PL and pump jacks)
1014.5 - PAGSB, follow flags 30 ft N and 30 ft up GPL
1016.5 - Paved road
1018.5 - Pipeline, use roads to NE to avoid
1022.5 - Partially buried Pipeline
1023 to 1038 - Trucks or ATV OK on line
1038.5 - Badger den/PKFD, follow flags to S 50 ft and up GPL 50 ft
1042.5 - PAGS, follow flags to S 30 ft
1043.75 - PAGSB, follow flags to avoid

1047 - PAGSB, follow flags to N 30 ft
1052.5 - Pipeline crosses line
1056 - 2 PAGSB, follow flags toward road to S 30 ft
1057 - Pipeline crosses line
1064.5 - Pipeline crosses line
1069 to 1069.5 - Pipeline crosses line
1070.75 - PAGSB, follow flags to N 10 ft
1071.5 - Pipeline crosses line
1074 -PAGSB, follow flags to N at 30 ft
1076.5 - Pipeline crosses line
1079.5 - Historical site
1079 to 1087 - Use roads and trails cross country travel OK as flagged
1087 - oilfield stay on existing roads and trails
1099.5 - Badger den/PKFD, follow new flagged line
1113 - Use road N of line 0 - 15 ft away if possible
1110 to 1120 - oilfield use roads as possible travel along lines OK
1120 - 1136 - stay on flagged trails OK
1136 - 1142 - Travel cross country OK - avoid flagging
1142 - 1145 - Cross country OK avoid flags
1145.5 - PAGSB, follow flagged line 30 ft W
1145.5 to 1146 - cross country on line OK
1146 to 1149 - follow flagged route 50 ft S of line to avoid burrows
1150.9 - PAGSB, follow flags 30 ft NE of line and back to line at 1150
1150.9 to 1153 - Cross country OK
1153 to 1160 - Move to road 0 - 50 ft W of line if possible
1160 - Pipeline crosses line
1166 - Pipeline crosses line
1166 to 1170 - Cross country OK use roads when possible
1172.5 - Pipeline crosses line, cross country travel OK
1173 - PAGSB, follow flags 20 ft NE
1174.2 - follow flags 20 ft NE
1174.2 to 1179 - Travel on line OK
1179.9 - Pipeline crosses line, drive 15' E
1180 to 1182 - cross country OK
1183 - move to road 0 - 20 ft N of line if possible
1184 - Use oilfield roads travel along line OK
1186 to 1195 - OK on line.
1195.4 - PGKRB, follow flags 30ft E
1196 to 1222 - OK on line.
1223 - Follow flags 30ft E
1234 - PBNLLB, use existing road to avoid
1224 to 1240 - Oil field, use existing roads and trails
1240 road
1241.5 PAGS burrows
1244 PKF den 10' S of line
1249 badger dig 25' S of line
1251 road
1253 wash
1260 road
1263 road and pipeline
1270 pipeline
1271 road and pipeline
1271.2 PKF den 40' S of line
1273 PKF den 25' S of line
1282 Badger dig in wash
1281 Deep wash. Trucks follow flags to cross, and avoid PKF dens on line 80' E of station
1286.8 fence, sump on S side
1288 road
1293.8 - PKF den 10' S of GPL

1300 wash, too deep for trucks. Use roads
1307 road
1310 road
1311 pipeline
1313 road
1317 road
1320 road
1322 pipeline

Geophone Line 1128

1000(BOL) to 1016 - Oil field, many pipelines, well pads, rd. cuts, use existing rds. where possible.
1010 - PKFD 50' N of station and 42' E, follow flags to W to avoid by 50'.
1035 - PAGSB about 35' S of station. New drive around flagging added, follow flags to W to avoid by 30'. Suggest laying out on foot in this area.
1042 - PAGSB about 36' N of station, follow flags to E to avoid by 30'.
1044.5 - PKFD and PAGSBs, follow flags to E to avoid by 50 and 30'.
1055 - Le Conte's thrasher heard in area, drive around large shrubs.
1061 - Pipeline crosses line, pet cemetery near pipeline.
1061.5 - PAGSB, follow flags to E to avoid by 30'.
1072 - Hwy. with fence on both sides.
1073 - PAGSB about 35' N of station, stay on existing rds. and follow flags to avoid.
1078.5 - PAGSB, follow flags to W to avoid by 30'.
1086 to 1091 - bare ground, storage yard, developed area.
1097 - PGKRBs, PAGSB, PBNLLBs on both side of line, move station 50'N or onto flagged route around burrows to avoid by 50'.
1111 - Deep wash, use existing rds. to avoid if possible.
1116 - Out of oil field area from this station on mostly habitat.
1120.5 - PAGSB, follow flags to existing rd. to avoid by 30'.
1124 - PAGSB about 60' N of station, follow flags W of line to avoid by 30'.
1125 - PAGSBs about 36' N of station, follow flags to W of line to avoid by 30'.
1126 - PAGSB about 33' S of station, follow flags to W to avoid by 30'.
1127 - PAGSBs about 40 and 20' S of station, move station 10' N and follow flags W to avoid by 30'.
1127.5 - Pipeline crosses line.
1131 to 1134 - Oil Field area, many pipelines, use existing rds. if possible.
1135 - PAGSB 33' S of station, follow flags W to avoid by 30'. PAGSB 50' N of station, follow flags W to avoid by 30'.
1137 to 1181 - Steep terrain, oil field area, many pipelines, vehicles use existing rds. if possible.
1142 - PAGSB 12' E of station, follow flags W to avoid by 30'.
1143 - PAGSB 9' S of station, follow flags E to avoid by 30'.
1149 - PKFD, move station to flagged line, follow flags E to avoid by 50'.
1152 - PAGSB 50' S of station, follow flags W to avoid by 30'.
1155 - PAGSB 30' N of station, foot traffic OK, vehicles stay on existing rds. to avoid by 30'.
1166 - PAGSB 45' N of station, follow flags W to avoid by 30'.
1167 - PAGSB, move station 25' S, N or on flag line, follow flags E to avoid by 30'.
1176 (New Flags) - PAGSBs(many) just W of station, follow GPL flags E to avoid, drive on E side of flag line, lay out on foot here if possible. Source line comes into GPL here, suggest using existing road instead of driving up hill - too many burrows.

1181.5 - Le Conte's thrasher heard near line, avoid large shrubs in this area.
1190 - PAGSB 60' S of station, follow flags W to avoid by 30'.

1199 to 1200 (New Flags) - PAGSBs(2), follow flags on existing road and to W to avoid by 30'.

1206 - Pipelines cross line.
1207 - PAGSB 36' N of station and 15' E of line, follow flags W to avoid by 30'.
1208 to 1221 - OK on line.
1222 - PAGSB 12' S of station, move station 13' N or onto flag line, follow flags W to avoid by 30'.
1223 to 1236 - OK on line.

1230 - Large burned area begins just S of station.
1237 to 1239 (New Flags) - (PAGSB) 30' N of station, follow flags W to avoid by 30' - original notes for station 1237 and 1238, see below). New Flags - Many PAGSBs along new route, follow flags closely, lay out on foot here if possible.
1238.5 - PAGSB, follow flags W to avoid by 30'.
1239 to 1240 - OK on line
1244 road
1244.1 PKF den on GPL. Use roads to avoid
1248.5 PKF den on GPL. Too steep for trucks
1249 PKF den 40' SW of line
1249.5 PKF den 15' NE of line
1253 road, and pipeline
1261 road and pipeline
1278 road
1298 road
1313 road
1318 road

Geophone Line 1136

999(BOL) to 1019 - Steep terrain with many pipelines, vehicle travel may be limited
1019 - Badger den/PKFD, follow flags E 50', back on line 50' beyond avoidance flags
1020 to 1073 - Oil field, steep, hilly terrain, use existing rds. When possible.
1074 - Le Conte's thrasher observed near station, avoid large brush in this area.
1076.5 - PAGSB, follow flags to W to avoid by 30'.
1077 - Hwy. with fences on both sides.
1086 - Just N of station is Chevron compound, chainlink fence with razor wire on top, no habitat inside fence.
1090 - First station found on N side of compound.
1093 - PKFD (pipe) about 30' S of station, move station 20' N, follow flags to E to avoid by 50' or stay on existing rds.
1104.5 - PBNLLB 15' E of line, follow flags to W of line to avoid by 30'.
1113 - PAGSB about 40' S of station, follow flags W to avoid by 30'.
1116 - PAGSBs about 10', 20', and 30' N of station, move station 20' S and follow flags E to avoid by 30'.
1125 - PAGSB 27' N of station, move station 3' S and follow flags W to avoid by 30'.
1127 to 1129 - Rough terrain, vehicles use existing rds. if possible.
1129 - PAGSB 40' S of station, follow flags W to avoid by 30'.
1130 - PAGSB 30' N of station, lots of pipeline near resource, vehicles stay on existing rds.
1131 to 1139 - OK on line.
1140 - PAGSB 30'N of station, follow flags up rd. and back to line, foot travel OK.
1142 to 1145 - PAGSBs, many burrows along line, no vehicle route available, foot travel only.
1145 to 1147 - Steep terrain, use existing rds. if possible.
1148 - PAGSB 60' N of station, many burrows between 1148 and 1149, follow flags E to avoid by 30'.
1150 - Badger den/PKFD 33' N of station, follow flags E to avoid by 30'. Pipeline 12' N of station.
1153 to 1181 - Steep terrain and oil field, many pipelines cross line, vehicles stay on existing rds. if possible.
1154 - Le Conte's thrasher observed near station, avoid large shrubs.
1155.5 - PAGSB, follow flags W to avoid by 30'.
1162.5 - PAGSB, follow flags W to avoid by 30'.
1163 to 1176 - OK on line.
1176.5 - PAGSB, follow flags E to avoid by 30'.
1181 - PKFD (pipe) 50' S of station and 12' E of line, follow flags W to avoid by 30'.
1182 to 1196 - OK on line.
1197 - PAGSB just N of station, follow flags W to avoid by 30'.
1198 to 1212 - OK on line.
1207 to 1215 - Tire tracks present along line before area surveyed for resources.
1213 - Erho, follow flags E to avoid. One set of tire tracks present when resource flagged.
1216 - Badger den/PKFD 45' S of station, PAGSB 30'S of station, many burrows on this part of line, stay on existing rds. to avoid.
1217 to 1240 - OK on line.
1238 - Large burned area N of this station. S of this station is large area of rolling grassland with

few shrubs.
1249 PAGS burrows
1255 PKF den
1254-1256 Arch site
1263 badger dig 100' S of GPL
1269 PAGS burrows
1288 PAGS burrows 70' N of station
1324-1327 Arch site

Geophone Line 1144

999(BOL)
1002 - PKFD (pipe) - Use existing rd. S of den and follow flags W to avoid.
1003 - PGKRB, follow flags N 30' and back to line 30' beyond
1003 to 1008 - Many burrows in a burned area, foot travel only or use rd. to E
1012 to 1020 - Very rough terrain, vehicle traffic may be difficult
1015.5 - PGKRB, follow flags S 15' and back to line 30' up line
1021 to 1039 - Oil field, vehicles use existing rds. if possible
1039.5 - PGKRB, follow flags W 30'
1039.8 to 1043 - Use existing rds. and trails if possible
1043 to 1055 - Foot traffic OK on line, trucks use existing roads if possible.
1055 to 1067 - Steep hilly terrain, foot travel OK on line.
1067.1 - PAGSB, follow flags 30' W.
1067.3 to 1078.8 - Steep hilly terrain, trucks stay on existing rds. if possible.
1079 - PGKRB, follow flags 30'off line.
1079 to 1093 - Steep hilly terrain, trucks use existing rds. if possible.
1093.4 - PBNLLB, follow flags 20' W.
1093 to 1098 - Oil Field, many pipelines, foot travel on line, trucks use existing rds.
1107.25 - PGKRB, follow flags W 50' and 30' up line.
1112 - PBNLLB, follow flags 30' W and 30' up line.
1117 - PGKRB, follow flags W 30' and 30' up line.
1119 - PGKRB, follow flags W 30' and 30' up line.
1121 - PBNLLB, follow flags W 30' and 30' up line to rd.
1128 - Rough and steep terrain, use existing rds. if possible.
1129 to 1144 - Ok on line.
1144.5 - PAGSB, follow flags line W 30' and 30' up line.
1146 - PAGSB, follow flags E 30' and 40' up line.
1147 (New Flags) - PKFD on new flagged line, PAGSBs NE of PKFD, too many burrows for driving on line, lay out on foot in this area if possible.
1148.5 - PAGSB, follow flags 40' E and 40' up line.
1151.25 to 1152 - PAGSBs, many burrows along line, follow flags 50' to rd.
1152 - PAGSB, follow flags 30' off line and 30' up line.
1155.75 - PGKRB, follow flags E 30' and 50' up line.
1158.5 - PAGSB, follow flags line E 30' and 30' up line.
1160.5 - PBNLLB, follow flags 30' off line and 30' up line.
1163.5 - PAGSB, follow flags E 30' and 30' up line.
1166 - BOB, follow flags W 70' and 60' up line.
1167 (New Flags) - PAGSB follow flag W to avoid by 30'.
1167 to 1180 - Steep hilly terrain, trucks use existing rds. if possible.
1179.8 - PKFD, follow flags to W to avoid by 50'.
1180 to 1185 - Steep hilly terrain, trucks use existing rds. if possible.
1185.5 to 1190 - Pasture, trucks OK on line if needed.
1190 to 1199 - OK on line.
1199.5 - BOB, follow flags W 50' and 60' up line.
1212 - PGKRB, follow flags E 30' and 30' up line.
1213 to 1223 - OK on line, use rds. where possible.
1223 - BOB, move station to flag line and follow flags 50' W.
1224.3 - PKFD/Badger Den, follow flags 40' W.
1224.5 to 1240 - OK on line, use rds. where possible.

1329 PAGS burrows
1275 Arroyo
1271.2 PKF den (old and collapsed) Stay on line to avoid
1260 road
1255 wash, new drive around OK
1248 wash. PBNLL habitat
1245.9 Badger dig/PKF den 25' E of station
1241.5 PKF den (inactive) Follow flags to avoid

Geophone Line 1152

999(BOL) to 1020 - Oil Field, many pipelines, trucks use existing rds. where possible
1020.5 - PGKRB, follow flags E 30'and back to line 50' up line
1048.25 - PBNLLB, follow flags E 30' and up 50'
1049 to 1070 - Travel on line OK, some very brushy areas should be avoided.
1071 - PErho just S of station, avoid flagged area.
1073 - PGKRB, follow flags E 45'to rd., reconnect with line 50' up
1076 - Hwy., look both ways
1077.5 - PGKRB, follow flags W 10', reconnect with line 30' up
1078 - Wash, use existing rds. to get past.
1079 to 1080 - OK on line
1085.5 - PGKRB, follow flags W 50' and 50' up line.
1091.5 to 1092.5 - Many PBNLLBs, follow flags to rd. E 60'.
1093.5 - PGKRB, follow flags E 30' and 30' up line.
1094.25 - PBNLLB, follow flags SE 30' and 30' up line.
1095 - Le Conte's thrasher near station drive around large brush.
1097 - PBNLLB, follow flags W 30' and 50' up line.
1099.5 - PBNLLB, follow flags W 10' and 30' up line.
1100.5 - PGKRB, follow flags to rd. 60' E and back to line at 1101.
1106 - PKFD, follow flags 50' E to rd. and back to line at 1107.
1108 to 1110 - Erho, use existing rds to N or S.
1111 - PBNLLB, many burrows along line, use existing rds., back to line at 1116.5.
1118 to 1119 - PBNLLB, many burrows along line, use rd. to W.
1119 to 1127 - Very steep, foot travel only use existing rds. where possible.
1127 to 1143 - OK for travel on line.
1143 - PGKRB, follow flags E 30' and 30' up line.
1148 - PGKRB, follow flags E 50' and 40' up line.
1148.5 - PAGSB , follow flags W 30' and 30' up line.
1153 - PBNLLB, follow flags E 30' and 30' up line.
1154.5 - PBNLLB, follow flags E 40' and 30' up line.
1156 - PAGSB, follow flags W 30' and 30' up line.
1156.75 - PGKRB, follow flags E 30' and 30' up line.
1163 to 1165 - Foot travel OK on line, use existing rds. where possible.
1165.8 - PKFD/Badger Den, follow flags 50' W.
1165.8 to 1179 - Hilly terrain, foot travel only on line, trucks use existing rds.
1180 - PGKRB, follow flags 20' W.
1181 - PGKRB, follow flags 30' W.
1181 to 1182.8 - OK on line.
1183.1 - PGKRB, follow flags 20' W.
1183.2 to 1184.5 - OK on line.
1185 - PKFD 45' S, follow **New Flagging** to avoid.
1187.8 to 1188 - PBNLLBs, follow flags 20' E.
1191.5 - PGKRB, follow flags E 30' and 30' up line.
1191 to 1208 - Trucks along line, OK
1233 - Southern end of large burned area.
1240 - Line ends for now.
1246 KF den 50' NE of station
1255 PGKR burrow 30' E of station
1263.5 Wash

1266 KF den (active)
1301.75 GKR burrow
1324 road (exclusive fencing on both sides)
1328 wash, too rough for trucks
1332 road
1335 old two track. access from N

Geophone Line 1160

1000(BOL)
1000 to 1012 - Steep hilly terrain, probably too steep for vehicles.
1003 - PAGSB, move station 25' N, S or onto flag line, follow flags W to avoid.
1009.5 - Coyote den under bush E of line, stay to W of line between 1009 and 1010.
1009 to 1011 (New Flags) - PAGSB in wash, follow flagging closely in wash to avoid.
1013 - PAGSB 25' S of station, follow flags E to avoid.
1014 to 1029 - OK on line.
1030 - PAGSB 10' S of station Move station 15' N or to flag line, follow flags E to avoid.
1031 to 1048 - OK on line.
1049 - PAGSB 45' N of station, follow flags W on existing rd. to avoid.
1052 - PAGSBs, many burrows along line, follow flags closely to avoid.
1053 - Coyote sized den 36' W of line, stay on line at this station.
1054 to 1077 - OK on line.
1078 - PAGSB 75' N of station, follow flags W to avoid.
1079 to 1089 - OK on line.
1090 - PAGSB 40' S of station, follow flags E to avoid.

Rd. to 1095 (New Flags) - PAGSB in middle of access, no room to get by on either side, lay out on foot.

1095 to 1124 - OK on line.
1125 - PBNLLB 20' and PAGSB 15' S of station, move station 15' N or to flag line, follow flags W to avoid.
1126 - PAGSB 75' S of station, follow flags W to avoid.
1127 - PAGSB 10' S of station, move station 20' N, follow flags E to avoid.
1128 - PAGSB 75' S of station, follow flags W to avoid.
1133 - Large wash, avoid if possible.
1137 - PKFD 80' S of station, follow flags W to avoid.

Rd. to 1139 (New Flags) - PAGSB just off road, stay close to flagging to avoid.

1139 to 1152 - OK on line.

Rd. to 1150 (New Flags) - PAGSBs near road to N, follow flags closely to avoid.

1153 - PAGSB 55' S of station, follow flags W to avoid.
1155 - PAGSBs 15' N of station, move station 15' S or to flag line, follow flags to avoid.

Rd. to 1159 (New Flags) - PAGSBs near GPL (newly flagged route along SL 5159), follow flags N to avoid.

1159 to 1170 - OK on line.
1171 - PKFD 75' N of station, follow flags W to avoid.
1175 - PAGSB 30' N of station, follow flags W to avoid.
1178 - PKFD 15' N of station, move station 15' S or to flag line, follow flags W to avoid.
1185 - PKFD 25' N of station, follow flags E to avoid.
1192 - PGKRB 50' S of station, follow flags E to avoid.
1199 - PKFD 25' E of station, follow flags W to avoid.
1200 to 1229 - OK on line.
1230 - PKFD 35' N of station, follow flags W to avoid.
1231 to 1240 - OK on line.

1243 PGKR burrows 50' SW of station
1246 GKR burrow (inactive) 30' S of station
1257 KF den
1260 Known KF den 80' NW of station
1267.5 PAGS burrows
1270 PGKR burrows
1274.5-1271 Arch site
1285-1286 PBNLL habitat
1304 wash, follow flags to cross
1307.5 wash, follow flags to cross
1322 road. Wash
1333 PKF den 25' from road
1334 road
1335 PKF den (inactive) eight burrows
1336 road
1348 road
1351 road

Geophone Line 1168

1000(BOL)
1000 to 1015 - Steep hilly terrain, some parts of line too steep for vehicles.
1007 - PAGSB 30' S of station, follow flags W to avoid.

1011 to 1013 (New Flags) - PAGSBs just off road follow road a little further W to avoid.

1012 - PBNLLB, move station 25' S or to flag line, many burrows in area, carefully follow flags to E to avoid.
1014.5 - PAGSB, follow flags W to avoid.
1027.5 - Pipeline crosses line.
1029 - PAGSB 50' S of station, follow flags E to avoid.
1031 - Wash, with one side too steep for vehicle travel.
1037 - PBNLLB 60' S of station, follow flags W to avoid.
1038 - PBNLLB 9' NE of station, move station 25' S, 30' N or to flag line, follow flags E to avoid.
1042 - Le Conte's thrasher seen near station, avoid large shrubs in this area.
1043 to 1054 - OK on line.
1055 - 1 PKFD/badger den and 2 coyote dens along berm where line is on top and dens are on bottom, follow flags E to avoid area.
1062 - PAGSB 21' S of station, move station 4' N, follow flags E to avoid.
1068 - Badger den/PKFD 30' S of station, follow flags E to avoid.
1069 - PAGSBs 25' S of station, move station 5' N and follow flags W to avoid.
1071 - PKFD 15' SE of station, move station 15' N or to flag line, follow flags W to avoid.
1072 to 1185 - OK on line.
1086 - PAGSB 50' N of station, follow flags W to avoid. Le Conte's thrasher heard near this station, avoid large bushes. Steep wash just N of station.
1087 to 1132 - OK on line.

1182 to 1184 (New Flags) - PAGSB on two track just off 50' corridor, suggest laying out on foot here if possible.

1133 - PAGSB 50' N of station, follow flags E to avoid.
1134 to 1149 - OK on line.
1150 - PKFD 10' N of station, move station 15' S or to flag line, follow flags E to avoid.
1151 to 1184 - OK on line.

1184 to 1190 (New Flags) - Too many PAGSBs along ridge lines in area, suggest laying out on foot in this area.

1185 - KKFPD 10' N of station, move station to flag line, follow flags W to avoid.

1187 - KKFPD 10' S of station (wood stake 22B-6), move station to flag line, follow flags W to avoid.
1190 to 1198 - OK on line.
1199 - PKFD 1' W of station, move station 25' N, S or onto flag line, follow flags E to E avoid.
1200 - PGKRB 45' S of station, follow flags E to avoid.
1202 - PGKRB 30' S of station, follow flags E to avoid.
1206 - PGKRB 50' S of station, follow flags W to avoid.
1210 - PAGSB 40' S of station, follow flags W to avoid.
1211 to 1223 - OK on line.
1224 - Badger den/PKFD - 45' N of station, follow flags W to avoid.
1226 - PKFD 20'S of station, move station 10' N or to flag line, follow flags W to avoid.
1236 - BOB 20' W of station, move station 50' N, S or onto flag line, follow flags E to avoid.
1357 (EOL)
1316.5 Bagder dig S. of line. Moved line 30' N. Follow flags to avoid.
1298.5 PAGS burrow. Follow flags along road to GPL.
1299-1280 Layout/PU on foot. Trucks can access GPL from existing two track trails @ 1290,1284,1282. Very steep along GPL,trucks may have difficulty.
1289.5 PKF den 20' S of GPL
1281.75 PAGS burrows.
1280.5 two track trail along ridge line
1270 KF den. Not active. Trucks follow flags 100' N to two track trail. Arch avoidance flags. Monitor needs to guide travel through this area.
1266 GKR burrows along line. Follow flags 40' N to avoid.
1262 PAGS burrows along line. Follow flags 30'N to avoid.
1243 Arroyo too steep for trucks to cross.

Geophone Line 1176

1000(BOL)
1000 to 1016 - OK on line.

1017 (New Flags) - PAGSBs (many) and Erho, follow flagging on existing road to avoid.

1018 - PKFD (pipe) 25' E of station, follow flags W along elevated pipeline.
1019 to 1029 - OK on line.
1030 - PKFD 40' S of station (many burrows under cement pad), follow flags along existing rd. to avoid.
1031 to 1041 - OK on line.
1042 - PAGSB 1' W of station, move station 25' N, S or onto flag line, follow flags E to avoid.
1047 - PAGSB 75' S of station, follow flags W to avoid.
1048 to 1073 - OK on line.
1074 - PAGSB 85' N of station, follow flags E to avoid.
1081 - PAGSB 50' S of station, follow flags E to avoid.
1082 - PAGSB 30' S of station, follow flags W to avoid.
1083 - PAGSB 5' W of station, move station 25' N, S or onto flag line, follow flags E to avoid.
1084 to 1098 - OK on line.
1099 - PAGSB 20' N of station, move station 10' S, follow flags E to avoid.
1106.5 - Fence line around dump, follow fence line W.
1111 - Fence line on N side of dump just S of this station.
1115 - PAGSB 65' N of station, follow flags E to avoid.
1117 - PGKRB 75' N of station, follow flags W to avoid.
1125 - PAGSB 60' N of station, follow flags W to avoid.
1131 - PAGSBs 40' N of station, follow flags E to avoid.
1134 - PAGSBs (3) 5' S, 40' S, 25' E of station; move station 25' N or onto flag line and follow flags E to avoid.
1136 - PGKRB 25' N, PKFDs(2) 60' N of station, follow flags E to avoid.
1141 - PGKRB 15' N of station, move station 15' S, follow flags W to avoid.
1142 - PGKRB 75' N of station, follow flags E to avoid.
1153 - PAGSB 30' N of station, follow flags E to avoid.
1156 - PGKRB 60' N of station, follow flags W to avoid.
1160 - PKFDs(4); 3 old dens at 30', 35' and 40' SE of station; 1 den 55' N of station, follow flags

W to avoid.
1161 to 1188 - OK on line.
1189 - PAGSB 25' N of station, follow flags E to avoid.
1190 to 1213 - OK on line.
1214 - KKFPD 80' S of station, follow flags W to avoid.
1215 to 1230 - OK on line.
1231 - PKFD 30' S of station (wooden stake 94 - 55), follow flags W to avoid.
1232 to 1240 - OK on line.
Geophone Line 1176 - 24 FEB 97
1362 (EOL) Access from SL 5360 to avoid pipeline.
1351.5 PGKR burrow N of line. Drive 30' S on flags to avoid
1341 New drive around (?) Ok on line
1337 PGKR burrows 40'W of station. Moved line 30' N.
1336 PGKR burrows 10' W of station. Moved line 30' S. Follow flags back to GPL
1335 GKR burrow 30' NE of station. Ok on line.
1332 Old KF den 40' NE of station. Not active. Moved line 30' S.
1313 PGKR burrow 25' E of station. Moved line 30' N. Follow flags back to GPL.
1310.5 PKF den. Entrance caved in. Moved line 60' S to avoid.
1308-1310 Steep and rough
1276 may be too steep for trucks
1275.5 PGKR burrows 20' S of line. Moved line 30'N to avoid
1269 Road
1261.5 Follow new drive line to avoid GKR burrows N of station 1260.
1259 PGKR burrows 40' W of station.
1248 GKR burrows, many holes. S 30' to avoid.

Geophone Line 1184

1000(BOL)
1001 - PAGSB 25' S of station, follow flags W along existing rd. to avoid.
1002 - PAGSB 35' N of station, follow flags W to avoid.
1007 - PKFD 45' S of station, follow flags W to avoid.
1008 to 1023 - OK on line.
1024 - PAGSB 35' N of station (sandy area with many burrows), follow flags W to avoid.
1025 - PKFD 35' S of station (cement pad with lots of burrows), follow flags W to avoid.
1027 - PAGSB 85' N of station, follow flags W to avoid.
1028 to 1038 - OK on line.
1039 - 2 PKFDs 25' S of station, follow flags E along dry creek bed to avoid.
1040 to 1068 - OK on line.
1069 - KKFPD 75' NW of station, follow flags E to avoid.
1070 - PAGSB 35' NE of station, follow flags E to avoid.
1071 to 1093 - OK on line.
1094 - PKFDs (2) 80' N of station, follow flags E and use existing rds. to avoid.
1096 - Fence at S side of land fill.
1114 - Fence at N side of land fill.
1120 - PAGSB 2' W of station, move station 25' N, S or to flag line, follow flags E to avoid.
1122 - PKFD 25' N of station, follow flags E to avoid.
1123 - PKFD 40' NE of station, follow flags W to avoid.
1124 to 1143 - OK on line.
1144 - PKFD 30' S of station, follow flags W to avoid.
1145 - PKFD 65' S of station, follow flags E to avoid.
1149 - PAGSB 20' S of station, move station 10' N, follow flags W to avoid.
1154 - PGKRBs (many precincts) 30' N of station, follow flags E to avoid.
1155 - PGKRB 25' N of station, follow flags 50' to 75' E and from previous station to avoid.
1157 - PAGSBs 25' N of station, follow flags E to avoid.
1158 - PAGSB 30' S of station, follow flags W to avoid.
1159 to 1223 - OK on line.
Geophone Line 1184 - 24 FEB 97
1224 - Burrows periodically along line too numerous to flag and impossible to flag a reasonable

route around. Recommend that GPL be laid out on foot from 1224 to 1240.
Resources that could be flagged around are as follows:
1224 - PAGSB 15' W of station, move station 30' E, W or to flag line, follow flags W to avoid.
1225 - PAGSB/PBNLLB 35' S of station, follow flags E to avoid.
1236 - Badger den 33' SE of station, follow flags W to avoid by 30'.
1239.5 - PKFD/badger den 25' E of line stay on W side of line here.
1240-1243 Ok on line
1243 Elk Hills KF den #9B-32 75' N of GPL (inactive). Ok on line.
1244.5 Elk HIlls KF den #9B-30 40' S of GPL (inactive). No entrances found. Ok on line.
1254 PAGS burrows. May be some take on a few burrows. Stay on line for least impact. Stake 8' S of GPL. tag says: Site 4.
1257 road
1257 tagged stake #0042-5
1258 PAGS burrows on GPL. Follow flags to avoid.
1260.5 Elk Hills KF den # 8B-23 (inactive). No entrances found. Follow flags to avoid.
1267 Elk Hills KF den #8B-4 30' N of line (inactive) - holes all caved in. Follow flags to avoid.
1269.5 Elk Hills KF den #8B-13 75' N of line (inactive). Follow flags to avoid.
1271 follow flags to avoid PKF den on GPL @ 1271.5. Inactive den, but open.
1272.5 road
1288 Arroyo, follow new flagged route (S) to road
1291.8 PAGS burrow. On road to 1292
1291-1302 OK on line
1309 two track along buried pipeline
1322.5 PKF den in bank of wash (inactive). Follow flags to avoid.
1323.5 Old two track
1328-1346 Brushy, with some old burrows. Travel along GPL OK
1346-1350 layout/PU on foot. Roads at both points. Many PAGS burrows.
1350-1355 trucks on roads
1355-1356 pipelines
1359-1360 Many PAGS burrows on GPL. Follow flags to avoid.
1361-1363 PAGS burrows, Stay on line for minimum impact. Possible takes here.
1365 Arroyo
1366-1367 (EOL) Ok on line

Geophone Line 1192

1000(BOL)
1009 - PAGSB 10' N of station, move station 20' S, follow flags W to avoid.
1009 - PAGSB 55' S of station, follow flags W to avoid.
1012 - PAGSB 20' N of station, move station 10' S, follow flags and use existing rd. E to avoid.
1020 - PAGSB, move station 30' N, S or onto flag line, follow flags and use existing rd. W to avoid.
1023 - PAGSB 25' N of station, follow flags and use existing rd. W to avoid.
1026 - PAGSB 60' S of station, follow flags and use existing rd. W to avoid.
1030 - PAGSB 5' W of station, move station 30' N, S or onto flag line E of line to avoid.
1039 - South side of fenced in oil tanks, use existing rd, to W and follow flags E to line.
1051 - PAGSB 40' N of station, follow flags W to existing rd. to avoid.
1052 to 1067 - OK on line.
1068 - PKFD 85' s of station, follow flags E and use existing rd. to avoid.
1070 - PKFD 20' S of station, move station 10' N, follow flags E to avoid.
1071 to 1085 - OK on line.
1085.5 - PAGSB, follow flags E to avoid.
1093 - PAGSB 10' N of station, move flag 20' S or to flag line, follow flags W and use existing rd. to avoid.
1096 - PKFD 25' S of station, follow flags E to avoid.
1102 - PAGSB 30' N of station, follow flags E and use existing rd. to avoid.
1112 - PGKRB 60' N of station, follow flags W to avoid.
1115 - KKFPD 10' E of station, move station 30' N, S or onto flag line, follow flags W to avoid.
1126 - PGKRB 50' S of station, follow flags E to avoid.
1128 - PGKRB 35' S of station, follow flags E to avoid.

1141 - PAGSB 30' S of station, follow flags E to avoid.
1151 - PGKRB 40' S of station, follow flags W to avoid. PKFD 25' S of station, follow flags W from last resource to avoid.
1151.5 to 1165 - OK on line.
1166 - PKFD 15' S of station, move station 15' N, follow flags W to avoid.
1185 - PAGSB 25' S of station, follow flags W on existing road to avoid.

1188 to 1191 - PAGSBs, too many to flag, lay out on foot only.
1201 to 1203 - PErho just S of 1202, PAGSBs N of 1202, lay out on foot, too many burrows to flag.

1206 - Erho all around station, move station to flag line, follow flags W to avoid.
1212 - PAGSB 15' W of station and at 1212.5, follow flags E to avoid.
1220 - Station in wash very close to the bank of the wash, moving station to bank might be a good idea.
1226 - PAGSBs(2) 45' S of station, follow flags E to avoid.
1230 - PAGSBs 6' and 30' S of station, move station 24' N or to flag line, follow flags W to avoid.
1231 to 1240 - OK on line.
Geophone Line 1192 - 24 FEB 97
1368 (EOL) Lots of oil field roads and trails for truck travel. Layout/PU on foot.
1361 follow old two tracks along line to 1357.
1353 Old KF/badger den (inactive). Follow flags to avoid.
1351-1348 trucks use oil field roads and trails
1348-1336 along line OK. Travel S of flags if possible
1335-1327 washed areas, too rough for trucks. Layout/PU on foot.
1333 PKF den 30' NE of station. Stay SW of drive flags to avoid.
1331 Badger dig 20' E of GPL. Drive on W of flags to avoid.
1327 road
1326-1321 road runs beside line - 4 LeCont's thrashers on road @ 1324.5
1320.5 PAGS burrows. trucks on road to 1320
1319-1314 Follow road S to 1314
1314 Arch site. Follow pin flags around to avoid and back to GPL
1308 Active AGS burrowing area. Follow flags to avoid (N) - Some GKR sized holes
1304 Pipeline (buried), trucks might not be able to cross. Road runs along pipeline (NE-SW).
1296 PAGS burrow on GPL. Follow flags to avoid
1291 road
1280 Old GKR burrows. In use by AGS or some other small mammals. Follow flags to avoid.
1279-1273 PAGS burrows on line. Follow flags for least impact. Possible take on some burrows.
1272 road
1268 PAGS burrows. Trucks on road. Layout/PU on foot.
1263.5 Follow flags coming off of road back to GPL
1261 road
1255.5 Arroyo, too steep for truck. Go back up line and follow road SW to SL 5255. Follow SL back to GPL @ 1255
1254.5 Badger dig 20' S of line. Stay on flags to avoid.
1252.5 Elk Hills KF den # 9B-27 (inactive). No entrances found. Ok on line.
1244 Elk Hills KF den #9B-36 75' N of line (inactive). One open entrance, overgrown. Ok on line.
Elk Hills KF den #9B-43 75' S of line. Two open entrances, with digging at each opening. Also fleas around the openings. OK on line. Monitor should check dens before travel along this section.
1243 Old KF den 25' N of GPL (inactive). Marked with wooden stake marked 9B-47-87. Travel on line OK. Travel S of line if possible.
1243-1240 OK on line.

Geophone Line 1200

1000(BOL)
1000 - PAGSB 40' S of station, follow flags E to avaoid.
1001 to 1017 - OK on line.
1018 - PAGSB 40' NW and 60' N of station, follow flags E to avoid.
1021 - PAGSB 10' W of station, move station 30' N, S or to flag line, follow flags E to avoid.
1026 - PAGSB 45' S of station, follow flags E to avoid.

1027 - Flag stolen.
1030 - PAGSB 70' S of station, follow flags W to avoid.
1035 - PKFD 40' S of station, follow flags E to avoid.
1040 - PAGSB 80' N of station, follow flags W to avoid.
1041 to 1087 - OK on line.
1088 - PAGSB 60' S of station, follow flags E to avoid.
1089 - PAGSB 35' S of station, follow flags E to avoid.
1093 - PAGSB 7' N of station, move station 23' S and follow flags E to avoid.
1094 - PAGSB 60' S of station, follow flags E to avoid.
1101 - PAGSB 5' W of station, move station 30' N, S or onto flag line, follow flags E along pave rd. to avoid.
1104 - PAGSB 45' S of station, follow flags W to avoid.
1106 - PAGSB 35' S of station, follow flags W along rd. to avoid.
1118 - PAGSB 10' N of station, move station 20' S or onto flag line, follow flags W to avoid.
1121 - PGKRB 55' N of station, follow flags W to avoid.
1127 - PKFPD 25' N of station (2 other dens in area), follow flags E along existing rd. to avoid.
1129 - PAGSB 50' N of station, follow flags E to avoid.
1138 - PAGSB 55' N of station, follow flags E to avoid.
1144 - PAGSB 15' S of station, follow flags E to avoid.
1153 - PAGSB 10' S of station, move station 20' N of station, follow flags and use existing rd. E to avoid.
1154 - Flags end here.
1186 - Flags start again.
1189 - Pipeline just N of station, two track E and connecting to line.
1196 - PAGSBs 39' N, 7' E, 50' S of station and in between, follow flags W to avoid.
1197 - PAGSB 50' S of station, follow flags E to avoid.
1199 - PAGSB 3' N of station, move station 27' S or to flag line, follow flags W to avoid.
1200 - PAGSB 30' N of station, follow flags W to avoid.
1206 - PAGSB/PBNLLB 25' S of station, follow flags W to avoid.
1208 - PAGSB/PBNLLBs 12' N of station, move station 13' S or to flag line, follow flags E to avoid.
1211 - PAGSB/PGKRBs 12' S of station, follow flags E from 1210 to existing road and back to line.
1211.5 to 1212 - PAGSB/PGKRBs (old GKR precinct), follow flags W on existing road and back to line.
1213 - GPL stops here.
1225 - GPL starts again.
1225 - PAGSB 25' N of station, follow flags E to avoid, if coming from N, stop at 1226 and lay out on foot to 1225.
1227 - PAGSB 5' W of station, move station 25' N, S or to flag line, follow flags E to avoid.
1230 - PAGSB on drive around from 1230 to 1232, follow flags W to avoid.
1236 - PAGSB 12' N of station, move station 18' S or lay out on foot, follow flags W to avoid.
1238.5 - PAGSBs(2), lay out on foot E of ditch, vehicles follow flags W to avoid.
1240 - PAGSBs(2) 15' E of station, follow flags W to avoid.
Geophone Line 1200 - 24 FEB 97
1240-1250 Ok on line.
1254 PGKR burrows. Line blocked off (may be arch. site).
1254.5 PAGS burrows 70' E of station 1255
1261 Elk Hills KF den #9B-42, 200' S of station (inactive). Stay on line for avoidance compliance.
1264 Elk Hills KF den #9B-13, 200' N of station (inactive). Stay on line for avoidance compliance.
1269 PKF den 100' W of station. Follow flags to GPL.
1272.5 PAGS burrows. 10' S of line. Moved line Follow along flags, driving on the S side of flags if possible.
1274 PGKR burrows. 10' N of GPL. Moved line 40' S. Drive along S side of flags if possible.
1278 PAGS burrows along line. Moved line 30' N. Drive on N side of flags if possible.
1294 KF den on line. Trucks follow flags 100' S. Drive on S side of flags if possible.
1295 PAGS burrow 10' N of line. Moved line 30' S. Drive on S side of flags if possible.
1297 KF den on line. Moved line 100' S. Drive on S side of flags if possible.
1298.5 KF den on line. Moved line 100' S.
1312 two track road- truck travel OK.
1317 PAGS burrows in road. Some GKR size, but no evidence of GKR Keep on two track to minimize impact.
1320 Arroyo, layout on foot. Trucks stay on old two track
1329 trucks on old two track. follow flags to SL, then drive SL to GPL @ 1332.

1343 AGS burrows on line. Follow flags to avoid.
1351 PAGS burrows on line. Follow flags to avoid.
1354.2 KF den (inactive), 2 entrances. Layout/PU on foot. Trucks drive along pin flags NE of line. Follow flags back to GPL @ 1356.
1370.2 GKR precinct on GPL. classic GKR holes, mowed area. multiple precincts in area. Follow flags 75' N to avoid.
1371 PKF den 20' N of line. Keep on flags, to road @ 1372
1372 PGKR burrows on line.
1373 Pipeline
1375 Pipeline
1372-1379 (EOL) Use roads to avoid pipelines

GPL 1208

1065 (BOL)
1068.5 - PKFD (buried pipe) 10' W of line, follow flags E, to avoid.
1077 - PAGSB 12' N of station, follow flags E to avoid.
1078 - PAGSB 40' S of station, follow flags W to avoid.
1079 - PAGSBs(3) 60' S, at station, and 15' W of line, follow flags E to avoid.
1090 - PAGSBs(2), follow flags W to void.
1093 - PAGSB 55' N of station, follow flags E ,to avoid.
1095.5 - PAGSB 15' E of line, follow flags W to avoid.
1101 - PKFD 6' W of station, follow flags on existing roads to avoid. Raven nest in tree.
1103 - PAGSB 60' N of station, follow flags E to avoid.
1105 - PAGSB 35' S of station and 12' E of line, follow flags W to existing road, avoid PAGSBs on edge of road by staying on W side of road.
1107 - PAGSB 40' S and 12' E of line, follow flags W to existing road to avoid.
1109 - PAGSB 25' NE of station, follow flags E on existing road to avoid.
1121 - PKFDs (8" pipes) 54' E of line, stay close to line at this station to avoid.
1130 - PAGSB 25' N of station, stay on existing road and follow flags W to line.
1135 - PAGSB (not occupied) 40' S of station and 20' W of line (stake with metal tag numbered 24B - 47), stay on E side of line to avoid.
1137 - PAGSBs 40' S of station, follow flags E to avoid.
1141 - PKFD 60' N of station and 50' W of line, old KFPD (grown over and no scat), check if vibes driving by.
1143 - PAGSB 30' SE of station, 50' S (old GKR) of station, follow flags W to avoid. PAGSB 60' N of station, follow flags E to avoid.
1144 - PAGSB/GKRBs 30' SW of station, continue from previous station to follow flags E to avoid.
1144 - Flags end here.
192 - Flags start here.
1192.5 - PAGSBs, follow flags W to avoid.
1196.5 - PAGSB 9' E of line, follow flags W to avoid.
1199 - Large wash.
1199.5 - PAGSB/PBNLLB, follow flags W to avoid.
1202 - Flags end here.
1230 - Flags start here.
1230 to 1257 - **LAY OUT ON FOOT**, too many burrows to flag. Road nearby.
1250 - PBNLLBs, stay outside flagged area even on foot.
1257 - Flags end.
1269 - Flags start.
1269 to 1277 - **LAY OUT ON FOOT**, too many burrows to flag.
1277 - PKFD (old den) 25' N and 45' E of station. PAGSBs 25' N of station, follow flags W to avoid.
1279 - KFPD (old and delapidated, marked with metal post, but no sign on top) 50', N and 45' W of station, stay close to line here.
1283 - Badger dig, recent, 2.5' deep, check if vibes are going by at a later date.
1286 - PAGSB 50' S of station, follow flags W to avoid.
1293 - PAGSBs, follow flags W to avoid.
1294 - PKFD (old KFPD staked and numbered 5B - 20) 40' E of station.
1294.5 - PAGSBs, follow flags W to avoid.
1296.5 - PAGSBs/PBNLLBs in wide sandy wash, follow flags W to avoid.

1302.5 - PAGSBs, follow flags W to avoid.
1308 - PKFD (many old overgrown dens on hillside, wood stake 6B -12), follow flags W to avoid.
1313 - PKFD (Old overgrown dens, wood stake 6B - 14) 30' W of line, 25' N of station, stay on E side of line here.
1315.5 - PKFD (Elk Hills KFD # 31R - 2) 50 ' W of drive around, stay E of flags.
1320 - PKFD (old KFPD, over grown) 50' W of station, stay on E side of line here. Other marked KFDs in area.
1331 - Wash, no drive around flags. PAGSBs in side of wash, lay out on foot if possible, good habitat, wash is sandy. Follow flags E to avoid if can't lay out on foot.
1355.5 - PAGSB, follow flags W to avoid.
1365.5 - PKFD, stay on existing road to W to avoid.
1356 to 1371 - Line parallels existing road, lay out on foot.
1371 - Flags end here.

GPL 1216

1065 (BOL)
1065 to 1075 - OK on line.
1076 to 1078 - Private residence fenced orchard and yard.
1086 - Coyote sized den, coyote scat at entrance, 30' E of line, not flagged, stay close to line here.
1095.5 - PAGSB, follow flags E to avoid.
1096 - PAGSB 33' S and 15' E of line, continue to follow flags from 1095.5.
1098 - PAGSBs 40' S of station, follow flags E to avoid.
1099 - PAGSB 60' N of station, follow flags W to avoid.
1108 - PAGSB 30' N of station, follow flags E to avoid.
1113 - PAGSBs 6' E and 65' S of station, avoid flagged area and follow flags W to avoid.
1114 - PAGSB 30' S of station, follow flags E to avoid.
1118 - PKFD 20' S of station, stay on existing roads to W to avoid. Den is a marked Elk Hills Kit Fox Den, could not read number.
1121.5 - PAGSBs, follow flags W to avoid.
1127 - PAGSB E and 50' N of station, follow flags W to avoid.
1133 - Drive route from roads to line cleared.
1133 - Flags end here.
1236 - Flags start here.
1236 to 1245 - Too many burrows to flag and find a route past, Erho around 1241 and on two track E of line **Lay this part of line out on foot.**
1245 - Flags end here.
1275 - Flags start here.
1275 to 1276 - PAGSBs, too many to flag, **lay out on foot.**
1279.5 to 1282.5 - Broad shallow wash
1286.5 to 1287 - PAGSBs, follow flags W to avoid.
1300.5 - Wash, stay close to line here.
1302 - Flags end here.
1313 - Flags start here.
1319 - small wash, one side is 2 to 3' high and vertical
1325 - PKFD (Elk Hills KFD # 31R -15) 35' N of station, follow flags E to avoid.
1347.5 - PAGSBs, follow flags W to avoid.
1350 to 1351 - 2 washes converging in to one. Drive around goes down stream, lay out on foot here if possible, good habitat.
1353.5 - PAGSB 25' W of line, closely follow flagging.
1357.5 - Wash, may be too steep for jug trucks, no drive around flagged.
1359 - Flags end here

Geophone Line 1224

1280 - Flags start here.
1281.5 - Wash, steep on one side, too many PBNLLBs, don't drive through.
1283.5 to 1284 - PAGSBs/PBNLLBs, follow flags E to avoid.
1284 - Shallow wash just S of station.

1285.5 - PAGSBs, follow flags W to avoid.
1289 - Wash, too steep for jug trucks, no obvious way around.
1290 - Flags end here.
1319.5 - Flags start here.
1327 - PAGSB 45' N of station, follow flags W to avoid.
1342 - Erho, stay out of flagged area even on foot, follow flags W to avoid.
1340 - PKFD (6" pipe) on drive around, follow drive around flagging.
1347 - Flags end.

Geophone Line 1232

1323 BOL
1327 - PAGSB 40' N of station, follow flags W to avoid.
1328 - Steep wash. PAGSB on drive around at only place to cross wash, lay out on foot.
1334 - Large wash. On drive around, W of drive around in bank of wash is a badger dig not deep enough for KFD now but should be checked if vibes are going to drive by.
1335 EOL

APPENDIX B

SOURCE LINE SURVEY AND TRAVEL NOTES

Results of biological surveys are presented in this appendix for source lines. Avoidance flagging was placed around biological resources to limit vehicular traffic to agency required avoidance criteria. Results are presented by source line and station number.

Acronyms Used During the Chevron - Santa Fe Midway 3D Seismic Project

PKFD = Potential kit fox den
KKFD = Known kit fox den
KKFPD = Known kit fox pupping den
PAGSB = Potential antelope ground squirrel burrow
Badger Den = Badger Den
PBNLLB = Potential blunt-nosed leopard lizard burrow
GKRB = Giant kangaroo rat burrow
PGKRB = potential giant kangaroo rat burrow
BOB = Burrowing owl burrow
Erho = *Eriastrum hooveri* (Hoover's woolly-star)
BOL and EOL = Beginning and End of Line
Crypto = Cryptogamic soils
CL = Center Line
RSE or EOR = Road side edge or Edge of Road
ft = feet
PL = Pipeline
ca = approximately (circa)

SOURCE LINE SURVEY NOTES (20 February 1997)

Source Line 4999 (5001 5088 to 4999 5095)

5001 5088 to 5000 5089 - Brushy wash, no resources found.

4999 5090 to 4999 5095 - Sewage Disposal area, disced on a regular basis, CA ground squirrels present.

Source Line 4999 (5056 to 5063)

No resources found.

Source Line 4999 (4999 5120 to 5001 5127)

No resources found.

Source Line 4999 (5152 to 5159)

No resources found.

Source Line 4999 (5184 to 5191)

No resources found.

Source Line 5000 (5112 to 5119)

No resources found.

Source Line 5001 (5048 to 5055)

5048 - 5050 - on line OK 5050.5 drainage and fence

5051 - 5055 - rolling hills trucks OK on line

Source Line 5001 (5001 5088 to 4999 5095)

No resources found, some California ground squirrel burrows.

Source Line 5001 (5144 to 5151)

5146 - PKFD (several pipes), use existing rd. from N to avoid by 50'.

5150 - PKFD (pipe), 20' E of station, use existing rd., follow flags S to avoid by 50'.

Source Line 5001 (5176 to 5183)

No resources found.

Source Line 5003 (5040 to 5047)

5047 - 5041 - OK on line

5041 - avoid PAGS burrows - drive 50 ft W of Line and then back to 5040

Source Line 5003 (5003 5072 to 5004 5079)

5072-5079 airport, OK on line

Source Line 5003-4999 (5003 5080 to 4999 5087)

5080-5087 OK on line

Source Line 5003 (5168 to 5175)

No resources found.

Source Line 5003 (5104 to 5111)

5015 - PAGSB 60' S of station, follow flags W or stay on existing rd. to E to avoid by 30'.
5107 - Pipeline crosses line.

Source Line 5003 (5136 to 5143)

5140 - PKFD 85' W of station, follow flags S to avoid by 50'.

Source Line 5005 (5032 to 5039)

5039 - 5032 - trucks along flags OK - keep on roads as possible

Source Line 5005 (5064 to 5071)

No resources found.

Source Line 5005 (5128 to 5135)

5135 - PKFD near station and PKFD 45' W of station, move station 50' E, N or S to flagged line, vehicles stay on existing rds. S around both dens.

Source Line 5005 (5160 to 5167)

No resources found.

Source Line 5005 (5192 to 5199)

No resources found.

Source Line 5006 (5006 5096 to 5005 5103)

5096 to 5103 - sewage dumping area, too many burrows to list- biologist needs to lead trucks through.

Source Line 5007 (5030 to 5031)

5031 - 5030 - use road to W to access 5031 and 5030 truck travel along flags OK.

Source Line 5007 (5055 to 5063)

5055 to 5056 - Large area of PErho, avoid flagged areas, move out to 5056.
5057 - PErho, avoid flagged area.
5059 - KKFPD 126' W of station, move station 24' E or out to flag line, follow flags S to rd. beside railroad to avoid by 150'.

Source Line 5007 (5055 to 5063)

5055 to 5056 - Large area of PErho, avoid flagged area.
5057 - PErho, avoid flagged area.
5059 - KKFPD 126' W of station, move station 24' E or out to flag line, follow flags S to rd. next to rail road tracks to avoid.

Source Line 5007 (5088 to 5095)

5088-5095 too many burrows to list, biologist to lead trucks

Source Line 5007 (5120 to 5127)

5122 - PKFD about 55' E of station, follow flags S or stay on existing rds. to avoid by 50'.

Source Line 5007 (5152 to 5159)

No resources found.

Source Line 5007 (5184 to 5191)
No resources found.

Source Line 5008 (5008 5048 to 5007 5055, 2 lines come together here, SL 5013 to 5010 is just to N)
5048 - OK on line

Source Line 5009 (part of SL 5008 above)
From GPL to 5048 - 5054 OK on line

Source Line 5009 (5084 to 5087)
5084 - PAGSB 15' E of station, move station onto flag line, follow flags N to avoid by 30'.
5086 - PKFD 15' SW of station, move station 35' E or onto flag line, follow flags S to avoid.

Source Line 5009 (5112 to 5119)
5119 - PErho just E of station, avoid flagged area.

Source Line 5009 (5144 to 5151)
5149 - PKFD 30' and 45' (pipe) W of station, follow flags S of station.

Source Line 5009 (5176 to 5183)
No resources found.

Source Line 5010 (5013 5048 to 5010 5054)
Truck travel OK along line

Source Line 5011 (5040 to 5047)
From GPL to 5040 through 5048 - follow avoidance flagging as presented below:
5042.5 - Badger den - stay on line
PAGSB @ 5042.75 - moved line N 30 ft
PAGSB @ 5044.5 - moved line N 30 ft
5045.5 - Badger den - moved line N 30 ft

Source Line 5011 (5104 to 5111)
5109 - Pipeline crosses line.
5111.5 - PKFD(pipe), move station 11' N, avoid by following flags to Geophone Line, rd. to N.
Pipelines just E of PKFD

Source Line 5011 (5136 to 5143)
No resources found.

Source Line 5011 (5168 to 5175)
5169 - PKFD 30' NE of point, move point 20' E or to flag line, follow flags S to avoid by 50'.

Source Line 5013 (5032 to 5039)
5032 - follow flags to 5035 (across road)
5035 - 5039 cross country OK

Source Line 5013 (5012 5064 to 5013 5071, includes 5015 5064 to 5015 5065)
5013 5065 to 5013 5071 (including 5011 5069) - No resources found, very brushy area with deep wash, use existing rds. if possible.

Source Line 5013 (5013 5096 to 5011 5103)

5013 5096 to 5011 5103 - Area around this line is a sewage disposal area and is disced on a regular basis, area is bare ground and short grass, many CA ground squirrels present.

Source Line 5013 (5128 to 5135)

5133 - Erho all around station and along rd. to station, point can be vibed if trucks can get up rd. and stay between flags, flags are placed right next to areas with plants.

Source Line 5013 (5192 to 5199)

No resources found.

Source Line 5013 (5160 to 5013)

No resources found.

Source Line 5015 (5016 5026 to 5015 5031)

5026 - avoid flags (100 ft E of flagging - PAGSB and Badger digs/dens)
back on line OK at 5028
5028 - 5031 - OK on line

Source Line 5015 (5015 5077 to 5013 5083)

Along rd. just N of Taft Airport, between rd. and airport fence.

Source Line 5015 (5088 to 5094)

5088 - Big wash 10' E of station.
5090 - Fence crosses line.
No flagging until 5094 which is last flag before GPL 1096.

Source Line 5015 (5120 to 5127)

5126 to GPL 1128 - Oil field, many pipelines, etc., stay on existing rds. if possible.

Source Line 5015 (5184 to 5191)

No resources found.

Source Line 5015 (5152 to 5159)

No resources found.

Source Line 5017 (5019 SL, but most pts. are 5017, 5019 5040 to 5015 5047)

needs to be resurveyed - No flags - found pin flags and flagging in a pile - possibly vandalized

Source Line 5017 (5080 to 5087)

5017 5081 to 5017 5087 - No resources found.
5017 5085.5 - Deep wash (narrow rd. just E of wash)

Source Line 5017 (5112 to 5119)

5118.5 - PKFD, follow flags S to avoid by 50'.

Source Line 5017 (5144 to 5151)

No resources found.

Source Line 5017 (5176 to 5183)

5176 - Large area of PErho and many PAGSBs around vp and extending to 50' S of 5177, move vp to

existing road if possible, follow flags closely to the S to avoid PErho and to avoid PAGABs by 30'. May run over a few plants at the existing road, but this appears to be the only way out.

5177 - PErho and PAGSBs begin 50' W of vp, see above.

Source Line 5019 (5104 to 5111)

5104 - PKFD 52' E of station, deep wash just E of PKFD, follow flags in from rd. and Geophone Line, return the same way to avoid by 50'.

5106 - PAGSB, move station 30' E, W or on flag line, follow flags to avoid by 50'.

5109.5 - PAGSB, stay on existing rd. to avoid.

Source Line 5019 (5168 to 5175)

5175 - PAGSB 50' E of station, follow flags N to avoid by 30'.

Source Line 5019 (5136 to 5151)

No resources found.

Source Line 5021 (5032 to 5039)

From GPL to 5021 5032 and to 5019 5040 - steep in places little to no trails stay on line up to (GPL from 5040)

Source Line 5021 (5096 to 5103) - Line not straight.

5020 5097- 5020 5098 - on dirt road (next to ballpark) and along fence (sewage treatment area) - travel along road okay

Source Line 5021 (5128 to 5135)

No resources found.

Source Line 5021 (5160 to 5167)

No resources found.

Source Line 5021 (5192 to 5199)

5199 - PAGSBs (2) 35' and 50' E of station, follow flags N to avoid by 30'.

Source Line 5023 (5024 to 5031)

at GPL and to 5024 - 5031

steep terrain - use road and trails when possible otherwise stay on line

Source Line 5023 (5088 to 5096)

W fence to sewage treatment plant just E of 5023/5088 - travel okay as flagged

Source Line 5023 (5120 to 5127)

No resources found, some steep terrain, stay on existing rds. if possible.

Source Line 5023 (5152 to 5159)

No resources found.

Source Line 5023 (5184 to 5191)

No resources found.

Source Line 5025 (5021 to 5023)

5023 - 5021 - OK as flagged

Source Line 5025 (5080 to 5087)

5081.5 - PAGSB - follow avoidance flagging to N to avoid by 30'.
5084 - NKFPD area - large area, many den openings of various sizes, adult and puppy size scat (weathered) on berms of den entrances, old prey remains. Closest den entrance to line is ca. 25 ft W of 5025/5084. Move VP 125 ft E or N. Narrow motorcycle trail goes through a portion of the den area. Follow avoidance flagging N to avoid by 150 ft.

Source Line 5025 (5112 to 5119)

5113 - PAGSB 40' W of station, follow flags to S to avoid by 30'.
5117 - PAGSB, follow flags S to avoid by 30'.
5118.5 - Pipelines cross line.

Source Line 5025 (5144 to 5151)

5145 - PKFD 55' E of station, follow flags N and use existing rds. to avoid by 50'.

Source Line 5025 (5176 to 5183)

No resources found.

Source Line 5027 (5032 to 5035)

cross country OK as flagged

Source Line 5027 (5104 to 5111)

No resources found.

Source Line 5027 (5136 to 5143)

No resources found.

Source Line 5027 (5168 to 5175)

No resources found.

Source Line 5029 (5028 to 5031)

5028 - 5031 - along flags OK

Source Line 5029 (5029 5032 to 5028 5035)

5035 - 5034 travel on road
5034 - 5032.4 - trash pile not accessible by vibes use road E of line
Station 5032 - trucks OK

Source line 5029 (5128 to 5135)

No resources found.

Source Line 5029 (5031 5096 to 5025 5103)

Travel OK along line, horse arena, vacant lot.

Source Line 5029 (5160 to 5167)

No resources found.

Source Line 5029 (5192 to 5199)

No resources found.

Source Line 5030 (Two lines right next to each other)

5028 to 5029 - many drainages, may not be accessible by vibes. Use road to get to 5029
5029 to 5032 - travel along line OK

Source Line 5031 (5024 to 5027)

Cross country travel on lines OK

Source Line 5031 (5088 to 5096)

5088 to 5096 - Highway, roads, horse arena, oilfield in this area. Travel okay along line as feasible.
5094 - Pipe Line
5091.5 - road, horse arena, and fences

Source Line 5031 (5031 5120 to 5033 5128)

No resources found.

Source Line 5031 (5152 to 5159)

No resources found.

Source Line 5031 (5184 to 5191)

5187 - PAGSB 20' W of point, move point 10' E and follow flags N to avoid by 30'.

Source Line 5033 (5018 to 5023)

Cross country travel along lines OK

Source Line 5033 (5112 to 5119)

No resources found.

Source Line 5033 (5144 to 5151)

No resources found.

Source Line 5033 (5176 to 5183)

No resources found.

Source Line 5035 (5104 to 5111)

No resources found.

Source Line 5035 (5136 to 5143)

5142 - PAGSB 30' E of station, follow flags N along existing rd .to avoid by 30'.

Source Line 5035 (5168 to 5175)

No resources on line.

Source Line 5037 (5028 to 5032)

Station 5031
GPL 1028 - 5032
5032.75 PAGSB - OK - use trails when possible gets into residential

Source Line 5037 (5036 5096 to 5037 5103)

5096 - 5100 - travel existing roads where possible
5100 - 5103 - travel along line okay

Source Line 5037 (5160 to 5167)
No resources found.

Source Line 5037 (5192 to 5199)
No resources found.

Source Line 5039 (5038 5024 to 5037 5032)
starts at 5038 (GPL 1024 - GPL 1032)
5031 PAGSB - moved line over 30 ft N

Source Line 5039 (5120 to 5127)
5120 - PAGSB 20' E of station, move station 20' W of station or to flag line.
PKFD 30' E of station, follow flags N to avoid both resources.

Source Line 5039 (5152 to 5159)
5157 - PAGSB 50' E of station, follow flags S to avoid by 30'.

Source Line 5039 (5184 to 5191)
5184 - PKFD near intersection with GPL 1184, follow flags N to avoid by 50'.

Source Line 5041 (5015 to 5023)
at 5015 - 5021.5 - badger den - moved SE 30 ft
very steep terrain - use roads and trails when available up to GPL 1024

Source Line 5041 (5112 to 5119)
5119 - PGKRB, move line S 50' and 50' up line.

Source Line 5041 (5144 to 5151)
5146 - PIFD 25' NW of point, move point 25' E, follow flags S to avoid by 50'.

Source Line 5041 (5176 to 5183)
5183 - PAGSB 20' W of point, move point 10' E, follow flags N to avoid by 30'.

Source Line 5043 (5104 to 5111)
No resources found.

Source Line 5043 (5136 to 5143)
No resources found, Oil field, many pipelines, use existing rds.

Source Line 5043 (5168 to 5175)
No resources found.

Source Line 5045 (5028 to 5031)
up to GPL from 5032 - okay along line

Source Line 5045 (5128 to 5135)
No resources found, Oil Field, many pipelines, use existing rds.

Source Line 5045 (5160 to 5167)
No resources found.

Source Line 5045 (5192 to 5199)
No resources found.

Source Line 5047 (5096 to 5103)
5096-5099 residential area, use existing roads
5099-5103 cross country along lines OK

Source Line 5047 (5120 to 5103)
No resources found.
5123 - Steep bank.

Source Line 5047 (5152 to 5159)
5047 - PAGSB 15' W of point, move point 15' E or to flag line, follow flags N to avoid by 30'.

Source Line 5047 (5184 to 5191)
5189 - PKFDs (2), one at point and 2nd 10' W of point, move point 50' E or to flag line to avoid by 50'.

Source Line 5048 (5056 - only point on line)
OK from GPL 1056 to 5048 5056.

Source Line 5049 (5112 to 5119)
No resources found.

Source Line 5049 (5144 to 5151)
5144 to 5149 - Steep terrain, use existing rds. if possible.
5149 to 5151 - OK on line.

Source Line 5049 (5176 to 5183)
No resources found.

Source Line 5051 (5013 to 5015)
(steep) use roads and trails when possible OK up to GPL 1016

Source Line 5051 (5104 to 5111)
No resources found.

Source Line 5051 (5136 to 5143)
No resources found, Oil Field, many pipelines, use existing rds.

Source Line 5051 (5168 to 5175)
No resources found.

Source Line 5053 (5096 to 5103)
5096-5103 travel cross country along lines OK

Source Line 5053 (5128 to 5135)
No resources, Oil Field, many pipelines, use existing rds.

Source Line 5053 (5192 to 5197)
5192 - PAGSBs 21' and 50' E of station, move station 9' W and follow flags N to avoid by 30'.
5193 - PAGSBs 9' NNE of station, move to existing road or to flag line and follow flags N to avoid by 30'.

Source Line 5053 (5160 to 5167)

5160 - PBNLLB 35' W of point, follow flags N to avoid by 30'.

Source Line 5055 (5055 line from 5056 to 5063 - line very crooked)

5056-5057 travel along lines OK
5058 highway
5059 fence, county maintenance yard
5060-5063 on line OK
5062 - fence

Source Line 5055 (5120 to 5127)

No resources found.

Source Line 5055 (5184 to 5191)

5186.5 - PAGSBs (many holes in area), follow flags N on existing road and back to line, stay on road if possible, watch for hole on edge of road.
5187 - PAGSB 15' E of station, move station to opposite side of road, follow flags S to avoid by 30'.

Source Line 5055 (5152 to 5159)

5158 - PGKRBs 60' W of point, follow flags S to avoid by 50'.

Source Line 5057 (5059 to 5062)

No resources found, habitat very disturbed.

Source Line 5057 (5112 to 5119)

5112 - PAGSB, move station to rd. 35' W or S or 25' up line to E, follow flags S to avoid by 30'.
5115 - PAGSB 36' W of station, follow flags S or stay on existing rds. to avoid by 30'.
5117 - Steep terrain, stay on existing rds. to 5119 if possible.

Source Line 5057 (5056 5144 to 5057 5151)

5144 - Badger den/PKFD 30' W of point, move point 10' E, follow flags N to avoid by 50'.

Source Line 5057 (5176 to 5183)

5178 to 5179 - Large steep sided wash.
5179 - PAGSB/PBNLLBs (many holes in area) 15' E of station and 12' S of line, move station 18 ' W or to flag line, follow flags N to old road to avoid by 30'.

Source Line 5059 (5012 to 5015)

use roads and trails when possible (very steep) up to GPL 5016

Source Line 5059 (5040 to 5041, rest of SL in residential area)

No resources found

Source Line 5059 (5104 to 5111)

5105 - PAGSB, follow flags S to avoid by 30'.

Source Line 5059 (5168 to 5175)

5171 to 5172 - Broad shallow wash.
5173.5 - PAGSB, follow flags S to avoid by 30'.

Source Line 5059 (5059 5136 to 5058 5143)

5137 - PBNLLB 75' east of point, follow flags S to avoid by 30'.

Source Line 5061 (5032 to 5039)

5062 - 5034 - most of line 5061 5039 and 5037 are now in Taft heights don't find them laid out

Source Line 5061 (5061 5056 to 5060 5063)

No resources found.

Source Line 5061 (5100 to 5104 - close to 5063 - 5101 to 5103)

No resources found.

Source Line 5061 (5128 to 5135)

5132.5 - PAGSB, follow flags to avoid.
5133 - PKFD 25' S, move pt. to flag line, follow flags to avoid by 50'.
5135 - PAGSB 30' off line, follow flagged line carefully.

Source Line 5061 (5160 to 5167)

5163 - PAGSB 12' W of station, move station 18' E, follow flags S to avoid.
5166.5 - Little wash crosses line.

Source Line 5061 (5192 to 5199)

No resources found.

Source Line 5062 (Line is split)

5062 5075, 5062 5076, 5061 5072 to 5061 5075, 5061 5071, 5060 5072, 5061 5071, 5062 5070 Mostly bare ground and black top in this area, all holes found have not been used for some time so none were marked.

Source Line 5063 (5028 to 5031)

BOL to 5031 - mainly city street except at BOL 31 to EOL native OK

Source Line 5063 (5063 5069 to 5062 5070)

No resources found.

Source Line 5063 (5064 5097 to 5063 5099)

OK residential area.

Source Line 5063 (5101 to 5103 -close to 5061 - 5100 to 5104)

No resources found.

Source Line 5063 (5120 to 5127)

5122 to 5123 - Follow flags N to existing rd. to drive between stations to avoid vegetation.
5123 to 5122 - Follow flags slightly N to existing rd. to drive between stations.

Source Line 5063 (5152 to 5159)

5158.5 - Tire tracks (turning around) on the ground before I got there, don't know if they are project related or not. No resources found.

Source Line 5063 (5184 to 5191)

5184 - PAGSB 20' W of station.

PKFD (old old KFPD area) 40' NW of station, move station 10' E, follow flags S to avoid PAGSB by 30' and PKFD by 50'.
5187 - PAGSB 50' W of station, follow flags N to avoid by 30'.

Source Line 5065 (5065 5112 to 5066 5119)
this line turns several times, parts of the line are through a burn over, no resources on indicated travel path

Source Line 5065 (5020 to 5023 - Line not straight)
5020 - 21 and 22 - ATV (non project) use and intensive disturbance in this area

Source Line 5065 (5065 5112 to 5066 5119)
Oil field area, stay on existing rds. where possible.
Le Conte's thrasher heard near line, avoid large shrubs.

Source Line 5065 (5144 to 5151)
5144 - PAGSB, move station 30' E or on flag line, follow flags to avoid.
5149 - PGKR, move station 20' E, follow flags to avoid.

Source Line 5065 (5176 to 5183)
No resources found.

Source Line 5065 (5208 to 5215)
5214 - PAGSB 33' E of vp and 5' S of line, follow flags S to avoid by 30'.
PAGSB 18' E and 12' N of vp, move vp 10' W to avoid by 30'.

Source Line 5067 (5066 5009 to 5067 5015)

Source Line 5067 (5067 5040 to 5068 5047)
No resources on line

Source Line 5067 (5067 5048 to 5065 5055)
No resources on line

Source Line 5067 (5072 to 5079)
No resources found.

Source Line 5067 (5104 to 5111)
No resources found.

Source Line 5067 (5136 to 5143)
Oil field area, use existing rds. where possible.

Source Line 5067 (5168 to 5175)
5168.5 - PAGSB/PBNLLBs, follow flags S or stop W of holes to avoid by 30'.
5169 - Impassable wash W of station.
Badger den/PKFD 27' E of station and 15' S of line (wooden stake 31G-9), many smaller holes in area, move station 20' W or out to flag line, follow flags N to existing road to avoid by 50'.

Source Line 5067 (5200 to 5207)
No resources found.

Source Line 5069 (5032 to 5039)
No resources

Source Line 5069 (5066 to 5071)
No resources found.

Source Line 5069 (5099 to 5103)
No resources found.

Source Line 5069 (5128 to 5135)
Oil field area, use existing rds. where possible.

Source Line 5069 (5069 5160 to 5068 5167)
5160 to 5161 - Highway with fence on each side.
5162 - Small wash E of this station, staying on existing roads could be the better option.
No resources found.

Source Line 5069 (5192 to 5199)
5194 - PAGSB 70' W of point, follow flags N to avoid by 30'.
5197.5 - PAGSB, follow flags N to avoid by 30'.

Source Line 5070 (5070 5086 to 5072 5090)
No resources found, line along rd. at N end of Taft.

Source Line 5071 (5024 to 5031)
5026 - 5027 - use road as indicated by flagging (south of original line)

Source Line 5071 (5058 to 5065)
No resources found.

Source Line 5071 (5071 5088 to 5072 5090)
No resources found.

Source Line 5071 (5120 to 5127)
5120 to 5126 - Oil field area, many pipelines, use existing rds. if possible.
5126 KF carcass several months old.

Source Line 5071 (5152 to 5159)
5158 to 5159 - Highway with fences on both sides.
No resources found.

Source Line 5071 (5184 to 5191)
5189 - PAGSBs 50' W of point and just S of line, follow flags N to avoid by 30'.
5191 - Badger den/BOB/KFPD(old) - 30' W of point, move 5191 120' E and 5190 35' W or both to flag line, follow flags N to avoid by 150'.
Truck tracks on ground crossing GPL 1192, don't know if project related.

Source Line 5073 (5016 to 5023)
5018 - AGS stay on road can stack E across road no resources along other side

Source Line 5073 (5074 5048 to 5073 5057)

5048 - 5055 - cross country travel along flags OK

5055 - 5057 - line goes down drainage (truck travel questionable - steep terrain) cross country travel OK

Source Line 5073 (5080 to 5087)

5087 - PAGSB 5' S of station, move station to flag line and follow flags N to avoid by 30'.

Source Line 5073 (5112 to 5119)

No resources found.

Source Line 5073 (5176 to 5183)

5176 - PAGSB 25' W of point, move point 5' E, follow flags S to avoid by 30'.

5182 - PAGSB 4' N of point, move point 30' E, W or to flag line, follow flags N on existing road to avoid by 30'.

Source Line 5073 (5208 to 5215)

No resources found.

Source Line 5074 (5074 5093 to 5075 5095)

5093 - PKF about 140' W of station, follow flags N of line to avoid by 50'.

Source Line 5074 (5074 5144 to 5073 5151)

Line steep and hilly, use existing rds. if possible.

5073 5150 - PAGSB, move line 30' S.

Source Line 5075 (5075 5008 to 5077 5011)

No resources, oil field area, stay on existing rds.

Source Line 5075 (5074 5040 to 5075 5047)

5040 - 5041 - use existing roads and trails

5041 - 5047 - cross country OK as flagged

5047 - old KF scats

Source Line 5075 (5078 5107 to 5075 5111)

Oil field area, stay on existing rds. if possible.

Source Line 5075 (5136 to 5143)

Oil field area, stay on existing rds. if possible.

Source Line 5075 (5168 to 5175)

5070 - PGKR/PAGSBs 18' S of point and slightly W of point, move point 50' E or to flag line, follow flags S to avoid by 50'.

Source Line 5075 (5200 to 5207)

5203 - PAGSB 21' E of vp, move 9' W to opposite side of road, follow flags to road to avoid by 30'.

Source Line 5077 (5077 5032 to 5076 5039)

5032 - 5035 - use existing roads and trails along fence line

5035 - 5039 - cross country along trail OK

Source Line 5077 (5064 to 5071)

No resources found.

Source Line 5077 (5128 to 5135)

Oil field area, stay on existing rds. if possible.

Source Line 5077 (5160 to 5167)

5160 - PAGSB/BNLLB 40' E of point, follow flags S to avoid by 30'.
5165 - PAGSB 75' W of point just off line, follow flags N to existing road to avoid by 30'.
5166 - PAGSBs, many holes which begin 8' E of point and 12' S of line, move point 18' W, follow flags S to avoid by 30'.

Source Line 5077 (5192 to 5199)

5192 - PAGSB 20' E, move point 10' W, follow flags S to avoid by 30'.
5195 - PAGSBs 15' N of point, move point 45' E, 40' W or on flag line, follow flags S to avoid by 30'.

Source Line 5079 (5024 to 5031)

Travel along line OK

Source Line 5079 (5056 to 5079)

No resources found.

Source Line 5079 (5088 to 5095)

No resources found.
5090 - 6' fence with barbed wire over hang just S of this station, fence surrounds a large area, habitat along line within fenced area is mostly bare ground, open gate where line comes out of fenced area.

Source Line 5079 (5120 to 5127)

5126.5 - PAGSB, follow flags 50' W to avoid by 30'.
5127 - PBNLLB, follow flags 30' E and use existing rd. to 5126.

Source Line 5079 (5152 to 5159)

5152 - PAGSB 20' N of point, Move pt 10' S, 20' E or 30' W, follow flags S to avoid by 30'.
5153 - Le Conte's thrasher seen near point, avoid large bushes in this area.
5157 - Steep wash just E of point.

Source Line 5079 (5184 to 5191)

5185 - Small but steep wash just E of point.
5187 - Small wash just W of point.
5189 - Wash just E of point.
5191 - Wash just W of point.

Source Line 5081 (5016 to 5023)

5019.5 - PGKRB, drive 20' W of line.
5020 - 5023 - travel along line OK

Source Line 5081 (5085 5048 to 5081 5052)

5052 - PAGSB, moved line 30 ft NW

Source Line 5081 (5080 to 5087)

5087 - PAGS ca. 15' N of line ca. 50' W of station, follow flags to S line or use road to N to avoid by 30'.

Source Line 5081 (5112 to 5119)

5114 - Oil field area, many pipelines, vehicles stay on existing rds. if possible.
5119 - Le Conte's thrasher heard near station, avoid large shrubs.

Source Line 5081 (5144 to 5151)

5144 - PAGSB N of line, move pt. to flag line, drive around to avoid by 30'.
5147.5 - PAGSB N of line, stay on existing rd. to avoid.
5150 - PAGSB 20 N, move pt. to S and follow flag line to avoid.

Source Line 5081 (5176 to 5183)

5177 - Small wash just E of point.
No resources found.

Source Line 5081 (5208 to 5215)

5208 - PKFD, follow flags N to avoid by 50'.
5213 - PKFD, follow flags N to avoid by 50'.
5214.5 - PKFD, follow flags N to avoid by 50'.

Source Line 5083 (5085 5008 to 5083 5015) - Line very crooked

5011 - rough habitat cross country not possible

Source Line 5083 (5072 to 5079)

No resources found.

Source Line 5083 (5096 to 5103)

No resources found.

Source Line 5083 (5084 5104 to 5083 5111)

No resources found.

Source Line 5083 (5136 to 5143)

5141 - PAGSB, move pt. to rd. to W, access 5141 along rd. if possible.
5141.5 - PAGSB, access toward 5141 along rd.
5142 - PAGSB 20' W, move to flag line and follow flags to avoid.

Source Line 5083 (5168 to 5175)

No resources found.

Source Line 5083 (5200 to 5207)

5202 to 5202.5 - PBNLLBs, follow flags S to avoid by 30'.

Source Line 5085 (5004 to 5007)

Oilfield use existing roads and trails.

Source Line 5085 (5032 to 5039)

5032 to 5032.5 - badger den - moved line over NW 30 ft
5033.75 - PBNLLB, moved line over 30 ft NW
5037.25 Fence to arena - cross fence again at 5044

Source Line 5085 (5040 to 5047)

No resources found.

Source Line 5085 (5096 to 5103)

5099 - PAGSB 25' E of station, follow flags to N to avoid by 30'.

Source Line 5085 (5128 to 5135)

5129 - PAGSB 40' E, drive slightly N to avoid, suggest following existing rd. N to access next pt.
5129 to 5130 - Follow flags slightly N to avoid vegetation.
5132 to 5133 - PAGSB, follow flags slightly N to avoid.
5133 - PAGSB 30' E of station, drive around to avoid by 30'.
5133 to 5134 - PAGSB, follow flags slightly N to avoid.
5134 - PAGSB 30 E, drive around to avoid by 30'.
5135 - PKFD 35' S of station, move station 15' to center of existing rd., stay on graded area if possible.

Source Line 5085 (5160 to 5167)

5165.5 - PAGSB, follow flags N on existing road to avoid by 30'.

Source Line 5085 (5192 to 5199)

5193 - PAGSBs 55' and 115' W of point, follow flags N to avoid by 30'.

Source Line 5087 (5024 to 5031)

1031.75 - PBNLLB, line moved NW 30 ft to road

Source Line 5087 (5056 to 5063)

5087 5063 - No resources found.

Source Line 5087 (5088 to 5095)

Travel cross country along lines OK

Source Line 5087 (5086 5120 to 5068 5127)

5125.5 - Flags moved slightly N to avoid vegetation.
5126.5 - Flags moved slightly N to avoid vegetation.

Source Line 5087 (5153 to 5159)

5158 - PAGSB 9' N of point, move point 21' S or 30' W or to flag line, staying on existing road might be a better option or follow flags S to avoid by 30'.

Source Line 5087 (5184 to 5191)

5187.5 - PAGSB along road flagged as travel route from offset point, stay to opposite side of road if traveling only between points.
5190 - PAGSB, move point 30' W or to flag line, follow flags S to avoid by 30'.
5191 - PKFD and coyote den 25' W of point and 18' N of line, many PAGSBs along line between 5191 and 5190, move 5191 25' E, follow flags S to avoid PKFD by 50' and all PAGSBs by 30'. Line is at the top of a steep slope into a wash, it might be easier to offset line here also, line is already offset to 5188.

Source Line 5089 (5016 to 5023)

5016 - 5018.5 - PAGSB, move line over 30 ft SE and travel along new route up to 5024

Source Line 5089 (5048 to 5055)

No resources

Source Line 5089 (5080 to 5087)

Travel cross country along lines OK

Source Line 5089 (5112 to 5119)

No resources found.

Source Line 5089 (5088 5144 to 5089 5151)

5144.5 - PAGSB, stay on rd. to avoid.
5147.5 - PAGSB, follow flags to avoid.
5148.5 - PAGSB, follow flags S to avoid.

Source Line 5089 (5176 to 5183)

5177 - Four holes that may at one time have been KF or badger dens are now only big enough for rabbits 66' E of point. Wooden stake with 30G-7-9 on metal tag next to holes.

No resources found.

Source line 5089 (5208 to 5215)

5214 - PAGSBs, follow flags to avoid.

Source Line 5091 (5008 to 5015)

5008 - use existing oilfield roads
between 5010 and 5012 stay on roads as much as possible

Source Line 5091 (5089 5040 to 5091 5047)

No resources found.

Source Line 5091 (5072 to 5079)

Travel cross country along lines OK

Source Line 5091 (5104 to 5111)

No resources found.

Source Line 5091 (5136 to 5143)

5136.5 - PAGSB, stay on rd. to avoid.
5137 - PAGSB 25' N, move pt. to E, stay on rd. to avoid if possible.
5138.5 - PAGSB, drive around to N or stay on rd. to avoid.
5040.5 - Pipelines cross line.
5043 - PAGSB at station, move pt. to W, drive around to avoid.

Source Line 5091 (5168 to 5175)

5170 - GKRBs just S of point, move point 50' E, 69' W or to flag line, follow flags N to avoid by 50'.
5171 - Old badger den/PKFD 27' W of point and 15' N of line, move point 20' E or to flag line, follow flags S to avoid by 50'.

Source Line 5091 (5200 to 5207)

5206.5 - PBNLLB, follow flags S to avoid by 30'.

Source Line 5093 (5092 5001 to 5093 5007)

5001 to 5007 - stay on existing roads

Source Line 5093 (5093 5032 to 5091 5039)

No resources found.

Source Line 5093 (5064 to 5071)

5064-5068 travel cross country along line OK
5068-5070 series of drainages, impassable by vibes, move lines 50 ft W to station 5071
5069.8 - PKF den, avoid flags by 50 ft
5070-5071 travel along line OK

Source Line 5093 (5096 to 5103)

No resources found.

Source Line 5093 (5128 to 5135)

5128 59 5129 - Use existing rd. to avoid dense saltbush area.
5130 - PAGSB, move 5' N and stay on existing rd. to avoid.
5135 - PAGSB 40' W, follow flags 30' S to existing rd.

Source Line 5093 (5160 to 5167)

5163 - Line appears to stop at this point.
5091 5164 - Point all by itself with no flags from 5093 line.
5165 - Line picks up again.
No resources found.

Source Line 5093 (5192 to 5199)

5199 - PAGSB 60' W and 60' E of point, follow flags N and over to GPL 1200 to avoid by 30'.

Source Line 5095 (5024 to 5031)

5024 - RSE
5025 - RSE
5026 - vibe at RSE
5026 - 5026.8 - follow road to flagged route
5030.2 - AGS and burrows follow flagged route to N

Source Line 5095 (5088 to 5095)

Travel cross country along lines OK

Source Line 5095 (5120 to 5127)

5123.5 - Drive to S to avoid vegetation if possible.
5127 - PAGSB, move pt. and drive 30' S to avoid.

Source Line 5095 (5152 to 5159)

5152 - PAGSBs (old GKRBs, possible that GKRs still here?) all around point, no way to get to point, too many holes, recommend moving point to existing road, route around to next point on existing roads flagged.
5153 - PAGSBs, holes from previous point end 50' W of point, do not go more than 20' past point on line, route to existing road surveyed and flagged.
5154 - PKFD, badger den, BOBs, PAGSBs all around point, move point 90' E to avoid PAGSBs by 30' and all other holes.

Source Line 5095 (5182 to 5191)

5191 - PKFD (old grown over KFPD) 99' E of point, follow flags closely to avoid by 50'.

Source Line 5097 (5016 to 5023)

No resources found.

Source Line 5097 (5048 to 5055)

5048 - stay on existing roads and trails that are 0 - 10 ft away from line
5049 - move 10 ft N and vibe road
5050 - on road
5051 - on road
5052 - move 10 ft S to road
5053, 5054 - vibe on road
5055 - to EOL OK

Source Line 5097 (5080 to 5087)

Travel cross country along lines OK. Use roads when possible

Source Line 5097 (5112 to 5119)

No resources found, Oil Field, many pipelines, use existing rds.

Source Line 5097 (5098 5144 to 5097 5151)

5145 - PAGSB near station, move station 30' W and drive around to avoid.
5150 to 5151 - PBNLLBs, follow flags N to avoid.

Source Line 5097 (5176 to 5181)

5179 - Steep sided wash, road on E side.
5181 - Last flag on line, fence around dump E of point.

Source line 5097 (5208 to 5213)

5213.5 - old PC valve, drive around route flagged.
No resources found.

Source Line 5099 (5040 to 5047)

5040 - deep drainage (cross at 5042)
station 5041 - may be accessed by road E of line. Cross drainage and go back to 5042
cross country along line OK from 5042 - 5047 - travel along existing roads when possible

Source Line 5099 (5072 to 5079)

Travel cross country along lines OK

Source Line 5099 (5104 to 5111)

No resources found.

Source Line 5099 (5136 to 5143)

GPL 1136 to 5136 - PAGSB, drive around to avoid.
5136 to 5137 - PAGSBs, drive around to avoid.
5138 to 5139 - PAGSBs, drive around to avoid.
5139 - PKFD 30' S, drive around to avoid.
5140 - PAGSB, drive around to avoid.

Source Line 5099 (5168 to 5175)

5168 - PAGSB/BNLLBs 42' E, follow flags S to avoid by 30'.
5171 - PAGSBs (old GKRBs) 25' N of point, move point 5' S, follow flags S to avoid by 30'.
5171.5 - PAGSBs (old GKRBs), follow flags S to avoid by 30', stay S of flags, many holes along this part of line, both N and S of line, monitor/biologist determine if flagged route is driveable.
5173 - PAGSB/PGKRBs 40' E of point, move point 10' W, follow flags S to avoid by 50'.

Source Line 5099 (5099 5188 to 5101 5191)

5188 - PKFD 50' SW of point, do not go past point (fence N of point and no points W of this one).

Source Line 5099 (5200 to 5207)

5202.5 - PBNLLB, follow flags S to avoid by 30'.

Source Line 5101 (5032 to 5039)

5034 - vibe on road if possible

No resources found.

Source Line 5101 (5064 to 5071)

Use roads as much as possible

Source Line 5101 (5096 to 5103)

OK on line

Source Line 5101 (5102 5128 to 5101 5135)

GPL 1128 to 5128 - PAGSBs, follow flags N to avoid.

5130 - PKFD, move 15' N or 30' W to existing rd. and follow flags S to avoid.

5131 - PAGSB near border of corridor, follow flagged line closely.

5134 - PKFD (culvert), follow flags N to avoid.

5135 - PKFD and PAGSB S of line, follow flagged line to N to avoid.

Source Line 5101 (5167 to 5160)

5099 5163 - Line offset to this point - PAGSB along travel route, follow flags E to avoid, use existing road toward end of travel route if possible.

5100 5161 - PAGSBs next to road on either side of point, the closest is 15' from point (10' down road and 10' W of road, road running N, S at this point), other hole is 45' N and 15' off road, move point 30' down road S of point if possible.

5160 - BOB 20' W of point, move point 30' E to existing road to avoid by 50'.

Follow existing road to next line if possible instead of using flagged route if possible.

Source Line 5101 (5192 to 5199)

5194 - PAGSB (old GKR) 18' S of point, move point 18' W or to flag line, follow flags N to avoid by 30'.

Source Line 5103 (5024 to 5031)

Cross country OK (use roads and trails when possible)

Source Line 5103 (5088 to 5095)

OK on line

Source Line 5103 (5056 to 5063)

PGKRB move line E.30',back to source line 30 ft beyond avoidance markers.

Source Line 5103 (5104 5120 to 5103 5127)

5124 to 5125 - Steep wash, use existing rd. S of wash.

5125 - PAGSB, drive around to N to avoid.

Source Line 5103 (5104 5152 to 5103 5159)

No resources found, line stays on existing roads in oil field area, points are all over the place and not flagged well, may have missed some, monitor/biologist check carefully.

Source Line 5103 (5110 5186 to 5103 5191)

5187 - PErho and PAGSBs starting 45' N (line appears to be going N here) of vp, stay on existing two track and avoid flagged area. Scattered plants on both sides and in the middle of road, also another area of PAGSBs. My best suggestion is to stay on the existing road and do not vibe until next vp (5186) is reached.

Source Line 5105 (5016 to 5023)

5016 to 5021 - cross country on flags OK
5021 to 5023 - stay on existing road

Source Line 5105 (5048 to 5055)

5055 - PKFD (6" pipe) in shrub between 5055 and GPL, trucks S to road at 5055 do not drive past pinflag
54, 5053 - vibe RSE 20 ft S if possible
5052 - vibe RSE 20 N if possible

Source Line 5105 (5080 to 5087)

5087-5086.5 travel OK on line
5086.5 - PGKR burrow, move line 20 ft S, then back to line
5086-5080 travel along line OK

Source Line 5105 (5112 to 5119)

No resources found.

Source Line 5105 (5144 to 5151)

5144 - PAGSB 5' from station, move station 25' W, drive around to avoid.
5145 to 5146 - PAGSB, drive around to N to avoid.
5146 to 5147 - PAGSBs, drive around to avoid by 30'.
5148 to 5149 - PAGSBs, drive around to avoid by 30'.
5149 to 5150 - Use existing rd. if possible.
5151 - PKFD and PAGSB on edge of corridor, follow flagged route carefully.

Source Line 5105 (5105 5176 to 5098 5180 - takes place of 5105 line)

No resources found.

Source Line 5195 (5108 to 5215)

No resources found.

Source Line 5107 (5040 to 5047)

GPL - 5047 ,46,45,44, 43, 42, 41, 40 - this whole line could be shifted 20 ft S onto existing road
5040 - is on the road already

Source Line 5107 (5072 to 5079)

Travel OK on line

Source Line 5107 (5104 to 5111)

No resources found.

Source Line 5107 (5106 5136 to 5107 5144)

5137.5 - PAGSB, use existing rd. to 5138.
5139.5 - PAGSBs, drive around to avoid by 30'.
5142 to 5143 - PAGSBs, biologist/monitor flag avoidance route.

Source Line 5107 (5168 to 5175)

5170.5 - PAGSB 25' N of line, follow flags S to avoid by 30'. AGS observed going into burrow 35'-40' N of line at same place along line. Many cross country vehicle tracks around the dump, cannot tell if they are project related.

Source Line 5107 (5108 5200 to 5107 5207)

5205 - Pipeline just E of vp, no drive around flags, no obvious route around.
5205.5 - PAGSB, follow flags S to avoid by 30'.

Source Line 5109 (5032 to 5039)

GPL - 5039 vibe on road 5 ft N of 5039 if possible
5038 - vibe on road 15 ft N if possible
5032 - AGS in a 6" underground drain pipe
5035.5 - PBNLLB

Source Line 5109 (5064 to 5071)

5071-5066.5 move line 30 ft N, then back to line
5066-5064 travel along line OK

Source Line 5109 (5093 to 5103)

Travel OK on line

Source Line 5109 (5128 to 5135)

5130 - PAGSB, burrows on both sides of line, follow flags to avoid.
5131 - PAGSB, move station 30' E, drive around to avoid.
5132 to 5133 - PAGSBs, use existing rd. to avoid.
5134 - PAGSB 20' S of station, move station 15' NE to existing rd. to avoid.
GPL 1136 to 5135 - PAGSB, follow flag line closely to avoid burrows at edge of corridor.

Source Line 5109 (5110 5152 to 5109 5159)

5107 5154 - Point off by itself with no flagged route to it, I surveyed and flagged route to point from existing road. No resources found, line stays on roads in oil field area and are not well flagged, monitor/biologist please check carefully.

Source Line 5109 (5160 to 5109)

5163 - PKFD (pipe) 50' N of point, stay S of flags.
PAGSB 36' W of point in middle of access to point, offset point to existing road N where other points are located if possible.

Source Line 5109 (5192 to 5199)

5195 - PAGSB 30' E and 25' N of vp, follow flags S to avoid by 30'.
5197 - PAGSB 9' W of vp, move vp 21' E or to flag line, follow flags S to avoid by 30'.
5199 - PAGSBs(2) 33' E of vp, follow flags S to avoid by 30'.

Source Line 5111 (5024 to 5031)

5031 - PBNLLB, moved line over 10 ft N.

Source Line 5111 (5056 to 5063)

Travel along lines OK

Source Line 5111 (5109 5088 to 5111 5095)

5088-5090.5 OK on line

5090.5 - PGKR burrow, move line 30 ft N, then back to line
5091.5 - PGKR burrow, move line 30 ft N, then back to line
5092-5095 OK on line

Source Line 5111 (5120 to 5127)

5121 - PAGSB 30' E of station, other holes in area, move station to rd. or follow rd. to avoid by 30'.
5127 - PKFD 50' S of SL, follow flags carefully to avoid.

Source Line 5111 (5184 to 5191)

5184 - PAGSB between vp and GPL, no flags to indicate route but assumed existing road (two track) would be used, driving past on existing road OK.
5185.5 - PAGSB 10' S of line, follow flags N to avoid by 30'.
5188 - Pipeline crosses line.

Source Line 5113 (5016 to 5023)

5021.5 - PAGSB, moved line NW 30 ft
OK up to GPL 1024

Source Line 5113 (5048 to 5055)

5052 - PAGSB ca 5 ft S of line and 25 ft E of station, follow flags 25 ft N of line
5053 - PAGSB ca 36 ft N of station, follow flags 30 ft N of line.

Source Line 5113 (5113 5080 to 5114 5087)

5080.5 - PGKR burrow, move line 30 ft N, then back to line
5081-5083.5 - PBNLL burrow, move line 30 ft N, then back on line
5084-5085 travel along lines OK
5085 - badger dens/PKFDs, move line N 40 ft, then back to line
5086 - PAGSB 300' N of station, line appears to go from 5114 5086 straight to 5118 5087, follow flags W to avoid.

Source Line 5113 (5112 to 5119)

5114 - PGKRB, move line N 50' and 50' up line.

Source Line 5113 (5113 5144 to 5114 5151)

5144 to 5145 - PAGSBs, drive around to avoid by 30'.
5147 - PAGSB 20' S of station, move station E or W, drive around N to avoid.
5150 - PAGSB, move pt. E or W 30', drive around to avoid.
5150 to 5151 - PAGSB N of line, drive S of line to avoid.
5151 - PKFD 50' of line, follow flagged route carefully.
5151 to GPL 1152 - PAGSBs in bank, drive around to avoid.

Source Line 5113 (5176 to 5183)

5179.5 - PAGSB, follow flags N to avoid by 30'.

Source Line 5113 (5208 to 5215)

No resources found.
Follow flagged routes to avoid pipes.

Source Line 5115 (5040 to 5047)

5046 - BOB (with sign) and PKFD ca 45 S of station and 15' N of line, avoid by leaving line at 5045.5 and driving 95 ft N of line and coming back to line at 5046.5, move vibe point 10 ft S of line.

Source Line 5115 (5072 to 5079)

5072 to 5076.5 - PBNLLB, move line 30 ft S, then back to line
5077-5079 travel along line OK

Source Line 5115 (5115 5104 to 5114 5111)

5107.5 - PBNLLB, move line S 30' and 40' up line.

Source Line 5115 (5143 to 5151)

No resources found.

Source Line 5115 (5200 to 5207)

5202 - PKFD, follow flags N to avoid by 50'.

Source Line 5117 (5032 to 5039)

Line is located along existing RSE

Source Line 5117 (5168 to 5175)

No resources found.

Source Line 5117 (5064 to 5071)

5064-5066.5 travel on line OK
5066.5 - badger burrow, move line 50 ft N, then back to line
5067-5071 travel along line OK

Source Line 5117 (5116 5096 to 5119 5103)

5103 - PGKRB, move line S 30' and up line.

Source Line 5117 (5128 to 5135)

5129 - PAGSBs near edge of corridor, follow flagged route closely in this area.
5130 - PAGSB, drive 40' S to avoid.
5131 to 5132 - PAGSBs near edge of corridor, follow flagged route closely.
5132 - PAGSB, move station 20' W or 55' E, follow flags to avoid.
5134 - PAGSBs, follow flags S to avoid.

Source Line 5117 (5192 to 5199)

5192 - Old abandoned KFPD 160' W of vp., Elk Hills marker with unreadable number, biologist/monitor check before vibing. Sheep are moving flags on this line.

Source Line 5117 (5160 to 5167)

No resources found.

Source Line 5119 (5056 to 5063)

Trucks OK on line

Source Line 5119 (5080 to 5087)

5081 - PAGSB 15' E of station, follow flags N to avoid by 30'.
5085 - PAGSB 40' E of station, follow flags S to avoid by 30'.

Source Line 5119 (5088 to 5095)

Sump pit, no lines laid

Source Line 5119 (5120 to 5127)

5122 - PAGSB along edge of corridor, follow flagged route closely.
5126 - Follow flags to existing rds. between stations where possible.

Source Line 5119 (5118 5152 to 5119 5159)

5154.5 - PAGSB, follow flags, stay on existing road to avoid by 30'.
5159 - Flagged route crosses pipes, I surveyed and flagged new route up hill to existing road if needed.

Source Line 5119 (5184 to 5191)

No resources found.

Source Line 5121 (5016 to 5023)

5016 to 5017 - cross country on flags OK @ 5017 (drainage at 5017 OK on flags)
5018 - pipeline (5018 - 5019 - cross country OK)
5019 to 5023 - use roads and trails when possible (cross country OK on flags)

Source Line 5121 (5048 to 5055)

No resources found.

Source Line 5121 (5080 to 5087)

Travel on line OK

Source Line 5121 (5112 to 5119)

No resources found.

Source Line 5121 (5144 to 5151)

5144 to 5145 - PAGSBs, drive around to avoid by 30'.
5145 - PAGSB on edge of corridor, follow flagged route carefully.
5148 to 5149 - PAGSBs N of line, drive S of line to avoid by 30'.

Source Line 5121 (5176 to 5183)

5180 - PAGSBs 36' W of vp, follow flags N to avoid by 30'.
5181.5 - PAGSB 6' N of line, Follow flags S to avoid by 30'.

Source Line 5121 (5208 to 5215)

5209.5 - Follow pipeline N to road to cross.

Source Line 5123 (5008 to 5015)

5008 - 5012 - use oilfield roads and trails
5013 - come in to source line on road NE of line and follow flags to 5013 then back online
5015 - OK on flagged line avoid burrows at 5015

Source Line 5123 (5040 to 5047)

5042 - PAGSB, avoid by driving 30 ft S of line

Source Line 5123 (5072 to 5079)

5072-5073.5 travel on line OK
5073.5 - PGKR burrow, move line 30 ft S, then back to line
5074-5079 travel on line OK

Source Line 5123 (5104 to 5111)

5107 - PGKRB, move line S 60' and 50' up line.

Source Line 5123 (5136 to 5143)

5136 - Le Conte's thrasher seen near station, avoid large shrubs. PAGSBs at edge of corridor, follow flagged route.
5136 to 5137 - PAGSBs, drive around to avoid by 30'.
5137 to 5138 - PAGSB, follow flags to N to avoid by 30'.
5138 - PAGSB 15' S, move station 15' N, drive N to avoid.

Source Line 5123 (5123 5168 to 5121 5175)

No resources found.

Source Line 5123 (5200 to 5207)

No resources found.

Source Line 5125 (5126 5000 to 5125 5007)

5000 to 5007 - use oilfield roads and trails

Source Line 5125 (5032 to 5039)

From 5035 W - line is in existing oilfield - use existing roads and trails as feasible

Source Line 5125 (5124 5064 to 5125 5071)

Travel on line OK

Source Line 5125 (5096 to 5103)

5096-5097.3 OK on line
5097.3 PBNLL burrow, move 30 ft E of line, cross drainage at flags, then back to line
5099 PAGS burrow, move line 50 ft E of flags
5100 PGKR burrow, move vibe point 30 ft E, then back on line
5100-5103 OK on line

Source Line 5125 (5128 to 5135)

5128 - PAGSB 15' S, move station 15' N or 30' E or W and follow flags N to avoid
Many burrows on edge of 50' corridor, follow flagged line closely.
5130 - PAGSB, follow flagged line to avoid.
5131 - PAGSB, follow flagged line closely to avoid burrows on edge of corridor.
Le Conte's thrasher heard near station, avoid large shrubs.
5132 - PAGSB, follow flags 20' S to avoid.
5133 - PAGSB on edge of 50' corridor, follow flags and stay on existing rds. if possible.
5135 - PKFD and PAGS on edge of corridor, follow flagged route closely.

Source Line 5125 (5192 to 5199)

5195 - PAGSBs 40' E of vp, follow flags S to avoid by 30'.

Source Line 5125 (5127 5160 to 5126 5167)

5160 to 5164 - Many holes in banks on both sides of road, did not flag.
5166 - PAGSB/PBNLLB 30' S and 35' W of vp, follow flags N to avoid by 30', fewer holes on N route.
5166.5 - PAGSB/PBNLLB, follow flags S to avoid, more PAGSBs to N.
5167 - PAGSB 40' E of vp, follow flags N to avoid by 30', badger digs N of line not deep enough to be dens at this time.

Source Line 5127 (5056 to 5063)

5056 - 5063 travel on line OK
5060 - Deep drainage, use existing rds. to get around.

Source Line 5127 (5089 to 5096)

5089 - 5093 OK on line
5093 - PGKR burrow, move line 30 ft E. use roads if possible
5094 - 5095 OK on line
5095 - PAGS burrow, move line 20 ft E to avoid

Source Line 5127 (5120 to 5127)

5122 to 5124 - PAGSB on edge of corridor, follow flagged route carefully.
5126 - PAGSBs, drive 30' S or to existing rd. to avoid.
5127 - PAGSB, follow flagged route to avoid.

Source Line 5127 (5126 5184 to 5127 5191)

5184 - PAGSB 10' W on edge of road, move vp 20' E or to flag line, use road if possible or follow flags S.

Source Line 5129 (5128 5112 to 5129 5119)

5113 - BOB, follow flags to avoid, come up line and back to rd.
5116.5 - PBNLL, follow flags 20' S.
5117 to 5119 - PGKRB and PAGSB, move line 30' S.

Source Line 5129 (5048 to 5055)

No resources found.

Source Line 5129 (5080 to 5087)

Line surveyed and vibed.

Source Line 5129 (5144 to 5151)

5148 - PAGSB, drive around to avoid by 30'.
Difficulty finding routes between stations on this line.

Source Line 5129 (5129 5176 to 5130 5183)

5177 - PAGSB 33' E, drive by if possible to S.

Source Line 5129 (5208 to 5215)

5211.5 to 5212 - PKFD, follow flags N to avoid by 50'.

Source Line 5131 (5040 to 5047)

No resources found.

Source Line 5131 (5072 to 5079)

Travel on line OK

Source Line 5131 (5104 to 5111)

5109 - PGKRB, move line 30' S to rd., use cleared area up to 5110.
5110 - PBNLLB, move line 20' S.

Source Line 5131 (5136 to 5143)

5136 - PAGSB near pt., move pt. to existing rd.

5137 - PAGSB 20' from pt., move pt. 10' onto bench above.
5138 to 5140 - PAGSBs along rd. access to these pts., stay in middle of rd. to avoid.
5141 - PAGSB near pt., move pt. to rd. to W if possible.
5142 to 5143 - PAGSB, follow flags to avoid.

Source Line 5131 (5168 to 5175)

5169 - PAGSB 45' W of vp on edge of two track drive by and vibe on vibe points if possible.
PAGSBs 18' NE and 45' E of vp on edge of two track on top of ridge, too steep on one side and good habitat (possibly too steep) on the other side. Staying on two track is the best choice here.
5170 - PAGSBs along same two track on same ridge, stay on two track.
Old PKFDs and possibly occupied coyote den south of vp. The flag I placed at the dens is about 200' from line but no way to be sure without tape because of terrain.
5171 - PAGSBs 5' N of vp, same problems as above, stay on two track.
5173 - Line splits at 5170, route to 5173 is on a two track, stay on two track, several burrows on edge of two track, did not flag.

Source Line 5131 (5208 to 5215)

5204 to 5204.5 - PBNLLBs, follow flags to avoid.
5202 - PAGSBs, follow flags to avoid by 10'.

Source Line 5133 (5032 to 5039)

Line is in intensive oilfields - use existing roads and trails

Source Line 5133 (5064 to 5071)

5065 - PAGSB 60' E of station, follow flags 30' N to avoid by 30'.
5068 - PAGSB 50' E of station, follow flags 30' N to avoid by 30'.

Source Line 5133 (5096 to 5103)

5097 - PGKR burrow, move line 30 ft S, then back to line
5101 to 5100 - numerous BNLL burrows, move line N 60 ft to avoid, then back to line at 5100

Source Line 5133 (5128 to 5135)

5133 - PKFD (culvert) 12' E of station move station 35' NW to existing rd. to avoid, drive on existing rd. as much as possible.

Source Line 5133 (5132 5160 to 5133 5167)

5160 to 5161 - Many holes in bank next to road, did not flag.
5161 - PAGSB 40' W of vp, follow flags N to avoid by 30' or drive by if possible. More holes along road, last one 35' W of 5162.
5162.5 - PAGSBs on both side of old two track, stay on two track.
5163 to 5164 - PAGSB 10' W of vp, move to flag line, follow flags N to avoid by 30' or stay on two track.
5165 - PAGSB 33' W of vp, follow flags N to avoid by 30'.

Source Line 5133 (5192 to 5199)

5199 to GPL - PKFD (marked, # 24B - 28), follow flags S to avoid.

Source Line 5135 (5056 to 5063)

OK on line

Source Line 5135 (5088 to 5095)

5095 move line 20 ft S, then back on line

Source Line 5135 (5120 to 5127)

5121 - PAGSB 20' from station, move station to flag line, follow flag line to avoid by 30'.
5125 - PAGSB, follow flags 30' N to avoid.

Source Line 5135 (5136 5152 to 5135 5159)

All vps on roads, many holes at edge of road an in bank next to road, did not flag.

Source Line 5135 (5184 to 5191)

5184 to 5185 - GKRBs, follow flags S to avoid by 50'.

Source Line 5137 (5048 to 5055)

No resources found.

Source Line 5137 (5080 to 5087)

Travel on line OK

Source Line 5137 (5112 to 5119)

No resources found.

Source Line 5137 (5137 5144 to 5138 5151)

5145 to 5146 - PAGSBs, many burrows, follow flags to avoid.
5147 - PAGSB near border of 50' corridor, follow flag line carefully.
5148 - PAGSB W of line, follow flags to rd. to avoid.

Source Line 5137 (5176 to 5183)

5176 - PAGSB 20' SE of vp, move vp 15' N and follow flags N to avoid by 30'.
5178 - Coyote den 35' S of line just W of vp, stay on line.

Source Line 5137 (5208 to 5212)

5208.5 to 5210 - PBNLLBs and arch. site, follow flags S to avoid.

Source Line 5139 (5040 to 5057)

No resources found.

Source Line 5139 (5072 to 5079)

Travel on line OK

Source Line 5139 (5104 to 5111)

5104.2 - PAGSB and PGKRBs, move line 30' S.

Source Line 5139 (5139 5136 to 5138 5143)

5137 - PKFD/PAGSB 40'S, follow flags to avoid.
5139 - PAGSB 20' S, move station to rd., follow flags to avoid.
5142 - PAGSB 20' W of station, move station 10' E, follow flags to avoid.

Source Line 5139 (5168 to 5175)

5172.5 - PAGSB, follow flags S to avoid by 30'.
Old badger dig 20' S of line, gets small 4' in, should be checked.
4173.5 - PAGSB, follow flags S to avoid by 30'.
5174 - Badger den 15' N of line, 25' W of vp (27' NW of vp), move vp 5' E, follow flags S to avoid by 30'.
5175 - Not well flagged by GIS surveyors, assumed line went down wash.

Source Line 5139 (5200 to 5207)

5204 - Drive S to road to avoid pipe. No resources found.

Source Line 5141 (5032 to 5039)

No resources found.

Source line 5141 (5064 to 5071)

No resources found.

Source Line 5141 (5096 to 5103)

5096-5103 travel along line OK

Source Line 5141 (5140 5128 to 5141 5135)

5133.5 - PAGSB, follow flags 30' N to avoid.
5134 - PAGSB, move station and follow flags 30' S to avoid.

Source Line 5141 (5141 5160 to 5137 5167)

5163 - Pair of Le Conte's thrashers seen near vp, avoid large bushes in this area if possible.
5167 - PAGSB 8' W, move vp 22' E and drive by burrow if possible.

Source Line 5141 (5192 to 5199)

5192.5 - PAGSB, follow flags N to avoid by 30'.

Source Line 5143 (5056 to 5063)

OK on line

Source Line 5143 (5088 to 5095)

5088-5089 OK on line
5089 drainage, cross road 50 ft E of line, then back to line at 5090. Travel along line to get back to 5091
5091-5094.5 OK on line
5094.5 - PGKR burrow, move 30 ft E, then back to line

Source Line 5143 (5120 to 5127)

5124.5 - Dense brush, use existing rd. if possible.
5126.5 - PAGSB, drive 30' S to avoid.
5127 - PAGSB, follow flags to avoid by 30'.

Source Line 5143 (5160 to 5167)

No resources, all vps on roads.

Source Line 5143 (5184 to 5191)

5190.8 - PAGSB, follow flags to avoid by 30'.
GPL to 5191 and 5187 - Follow flags N to avoid wash by 30 to 50'.

Source Line 5145 (5048 to 5055)

BOL 5048 - road
49, 50 , 51, 52, 53
5145 - 5055 - vibe on bare ground at 5055.1 if possible

Source Line 5145 (5080 to 5087)

5080-5087 OK on line

Source Line 5145 (5112 to 5119)

5114.5 - PGKRB, move line S 30'.
5117.5 - PGKRB, move line S 30' and 30' up line.
5119 - PGKRB, move line S 30' and 30 up line.

Source line 5145 (5144 to 5151)

5144 - PAGSB 10' N of station, move station to flag line and follow flags S to rd.
5147 - PAGSB 20' S of station, move station 10' S and follow flags to avoid.
5149 - PAGSB 20' E of station, move station 10' W and follow flags to avoid.

Source Line 5145 (5176 to 5183)

5182 - PAGSBs(2) 30' W of vp, follow flags N to avoid by 30'.
5183 - PAGSBs 25' and 45' W and at vp, move vp 30' E or to glag line, follow flags N to avoid by 30.

Source Line 5147 (5040 to 5047)

BOL to 5040 - road
5041, 5042, 43, 44, 45, 46, 47

Source Line 5147 (5072 to 5079)

OK on line

Source Line 5147 (5104 to 5111)

5105.25 - PKFD, move line N 50' and 40' up line.
5108 - PKFD, move line N 50' and 50' up line.

Source Line 5147 (5147 5136 to 5145 5143)

5139.5 - PAGSB, follow flags to avoid by 30'.
Many holes along border of 50' corridor, follow line carefully.
5141 to 5142 - PAGSBs, many burrows, biologist/monitor will need to find route around resources.

Source Line 5147 (5200 to 5205)

5200 - PAGSB 50' E of vp, follow flags S to avoid by 30'.

Source Line 5147 (5147 5168 to 5148 5175)

5171 to 5173.5 - Holes in bank next to road not flagged, stay on road.
5171.5 - PKFD/badger den -on bank next to road, stack on 5171 and 5172 and drive by den OK.

Source Line 5149 (5032 to 5039)

5032 - BOL what resource is flagged here on the well pad
5033 - on well pad
5036 - on road
37, 38 - 5039 - on road

Source Line 5149 (5064 to 5071)

5065 - PAGSB 50' W of station, follow flags S to avoid by 30'.
5069 - PKFD 10' E of station, move station 40' W or onto flag line, follow flags N to avoid by 50'.

Source Line 5149 (5096 to 5103)

OK on line

Source Line 5149 (5128 to 5135)

5129 to 5130 - Stay on existing rd. S of line if possible.
5135 - PAGSBs, move station 10' NW and drive S to avoid by 30'.

Source Line 5149 (5150 5160 to 5149 5167)

5163 - PAGSB/PBNLLB 12' E of vp, move vp 18' W or to flag line, follow flags S to avoid.
5167 - PAGSBs S of vp, closest is 9' S, move vp 21' N and drive by holes or back to flag line to next point.

Source Line 5149 (5149 5192 to 5148 5199)

No resources found.

Source Line 5151 (5056 to 5063)

5056-5058 OK on line
5058 - PAGS burrow, move line 30 ft SE, then back to line
5058.5-5062 OK on line
5062.1 - Badger/KF den, move line 50 ft S, then back on line to 5063

Source Line 5151 (5088 to 5095)

5095-5090 OK on line, use road when possible
5090 - PGKR burrow, move 30 ft N, then back to line
5089-5088 OK on line

Source Line 5151 (5120 to 5127)

5120 - PAGSBs, don't come off GPL to tet to vibe point, too many holes. Route to existing road flagged.
5120 - PAGSBs, move point 35' E and drive 30' N to avoid.
Le Conte's thrasher observed near station, avoid large shrubs.
5121 - PAGSB 25' N, move station 5' and drive 5' S to avoid.
5123 - PAGSB, move point 30' and drive 30' S to avoid.
5124 to 5125 - PAGSBs, move line 30' N to avoid.

Source Line 5151 (5149 5152 to 5148 5159)

5152 - PAGSB 25' W of vp, move vp 5' up flag line, stack and back out to existing road if possible. Old GKR precinct and other holes near vp.

Source Line 5151 (5154 5186 to 5150 5191)

No resources found.

Source Line 5153 (5048 to 5055)

5048 - PAGSB 15' W of station, follow flags N to avoid by 30'.
5049 - PKFD 45' SW of station, follow flags E to avoid by 50'.

Source Line 5153 (5080 5087)

No resources found.
5084 - follow flags around pipeline

Source Line 5153 (5112 to 5119)

5114.5 - PBNLLB, move line S 30' and 30' up line.
5115.5 - PGKRB, move line N 30' and 30' up line.
5119.25 - PGKRB, move line to rd. and 30' up line.

Source Line 5153 (5144 to 5151)

5145 - PAGSB 20' S, move station 10', drive 10' N of line to avoid.
5146 - PAGSBs, many burrows in area, biologist/monitor should determine route to avoid resources.
5147 to 5148 - PAGSBs S of line, drive N of line to avoid.
5150 - PAGSB NE of pt., drive to S to avoid.

Source Line 5153 (5176 to 5183)

5177 - PAGSB 15' E of vp, move vp 15' W, follow flags N to avoid by 30'.
5178 - PAGSB 4' E and 24' E of vp, move vp 26' W, follow flags to avoid by 30'.
5182 - PAGSB (old GKRBs) 7' W of vp, move vp 23' E and stack. Many holes in area, not all flagged, stay on road to power pole and then to vp, back out and use existing roads to 5181.

Source Line 5155 (5040 to 5047)

5047 - EOL
43 RSE
42,41 41 - 40 OK as flagged (shoots S to road)

Source Line 5155 (5072 to 5079)

5076 - PBNLL burrow, move line 30 ft W of flags, then back to line

Source Line 5155 (5156 5104 to 5155 5111)

No resources found.

Source Line 5155 (5136 to 5153)

5136 to 5137 - PAGSBs, many burrows on line, drive around by 30' to avoid.
5137 - PAGSB 15' S, move station 15' and drive 15' N of line to avoid by 30'.
5138 - PAGSB 25' NW of station, move station 5' E, and drive S of line to avoid by 30'.
5139.5 - PAGSBs, drive around by 30' to avoid.
5140 - PAGSBs near station, move station 30'and drive around 30' to avoid.
5141.5 - PAGSB, drive around by 30' to avoid.

Source Line 5155 (5168 to 5175)

5170.5 - PAGSB, follow flags to edge of wash, stack at 5170 and drive by resource.
No flags form 5168 to GPL, could not survey.

Source Line 5157 (5032 to 5039)

5039 - EOL use road 20 ft S of line
38 - RSE
36 - on road 35
5034 - Potential KF den 50 N of station, vibe along line okay or along RSE S of
5033 on well pad
5032 - on road
32 - BOL - road

Source Line 5157 (5064 to 5071)

No resources found.

Source Line 5157 (5096 to 5103)

5096 - PAGSB 45' W of station, follow flags to S to avoid by 30'.
5100.5 - Pipeline and rd. cross line.

Source Line 5157 (5128 to 5135)

5129 - PAGSB, move station 20' and drive around to avoid.
5129 to 5130 - PAGSB, drive N to avoid.
5131 - PAGSB 30' off line follow flagged route carefully.
5135 - PKFD 30' S of station, move 20' N to existing rd. to avoid.

Source Line 5157 (5156 5160 to 5158 5167)

All vps on existing road, many holes in banks next to road not flagged.

Source Line 5157 (5157 5192 to 5155 5199)

5193 to 5196 - vibe along roadside edge.
No resources found.

Source Line 5159 (5159 5056 to 5157 5063)

5058.5 - badger burrow, move line 50 ft NW, then back on line OK to 5056

Source Line 5159 (5088 to 5095)

5094 - Pipeline crosses line.
5095 - PAGSB/PBNLLB about 25' E of station, move station 5' W, follow flags N to avoid by 30'.

Source Line 5159 (5120 to 5127)

5120 - PAGSB 30' N, follow flags just S to avoid.
5121 - PAGSB, move station and drive around 20' S to avoid.
5121 to 5122 - PAGSBs, many burrows, follow flags to avoid.
5123 to 5125 - PAGSBs, many burrows, follow flags S to avoid.
5126 - PAGSB, move station 30' and drive around to aboid.
5126 to 5127 - Follow existing rd. if possible.

Source Line 5159 (5152 to 5159)

5159 - PAGSBs 45' E of vp, new badger dig (stops just around corner) 33' S of SL SW of vp, suggest vibing on vp and backing out to existing road. Rest of SL on roads, holes in banks next to road not flagged.

Source line 5159 (5159 5184 to 5156 5191)

5186 to 5187 - PAGSBs (many burrows), follow flags N to avoid by 30'.
5187.5 - PAGSB, follow flags N to avoid - drive by only, flag line avoids by 20 to 25' only.
5188 - PAGSB 9' S of vp, move vp 21' N to flag line, follow flag line N to avoid by 30'.
Some very old, fallen in, inactive GKRBs along line. Jug truck drove on line before it was surveyed.

Source Line 5161 (5048 to 5055)

BOL to 5048 OK
5051 move W to road 25 ft
5051 - EOL - AG
EOL - 5153 - 5055 - AG

Source Line 5161 (5080 to 5087)

No resources found.

Source Line 5161 (5144 to 5151)

5144 - PKFD 20' S, move station to avoid by 50' and drive 30' N of line to avoid
5146 - PAGSB 5'from pt., move station 45', drive around by 50' to avoid.
5150 - PAGSB 15' NW, move station 15', drive 15' S of line to avoid.

Source Line 5161 (5112 to 5119)

5113.5 - Steep little wash.

Source Line 5161 (5176 to 5183)

5178 to 5181 - Offset to road S of line, too many holes along line to flag, unable to flag routes around. Biologist/monitor may be able to guide vibes through.

5182 - PAGSB 6' S of vp, move vp 30' E and stack, come in from road at 5183.

Source Line 5163 (5040 to 5047)

BOL to 5163 - 5042 stay on road N of flagging

5044 is on road

5045 is on road 5046, 5047

Le Conte's thrasher heard at this station, drive around large shrubs.

Source Line 5163 (5072 to 5079)

5079 - PKFD 60' E of station, get to station from Hwy. to avoid by 50'.

Source Line 5163 (5104 to 5111)

5111 - Le Conte's thrasher heard near station, drive around large shrubs.

Source Line 5163 (5136 to 5143)

5136.5 - PKFD, use nearby rd. to avoid.

5137 - PAGSB 20' S of station, move station 10' N and drive 10' to avoid.

5143 - PAGSB, approach from N or move station N to avoid.

Source Line 5163 (5168 to 5175)

No resources found.

Source Line 5165 (5032 to 5039)

5032 - RSE

5033 - move S to RSE

5034 - RSE

5035 - 5036 - 5037 - 5038 - 5039

Source Line 5165 (5065 to 5071)

5065 - PKFD 6' W of station, move station 44' E or onto flag line, follow flags to S to avoid by 50'.

Source Line 5165 (5096 to 5103)

5096.5 Pipeline and dirt rd. cross line.

5096 - KKFPD 15' E of station, move station 135' W, 150' S to rd that crosses line, or onto flag line, follow flags (stay on rd. that crosses line to get out to 150') to N to avoid by 150'.

Source Line 5165 (5128 to 5135)

5128 - PAGSB near intersection with GPL, drive S to avoid.

5128 - PAGSB, move station and drive 15' N to avoid.

5128.5 - PAGSB, move line S to avoid.

5130 - PAGSB, stay on existing rd. to avoid.

5131 - PAGSB, move station to existing rd. to avoid.

Source Line 5165 (5160 to 5167)

No resources found.

Source Line 5165 (5192)

No resources found. Difficult spot, may want to move to road.

Source Line 5167 (5088 to 5095)

5167 5088.5 - Pipeline and dirt rd. cross line.
5168 5090 - PAGSB about 35' E of station, follow flags to S to avoid by 30'.

Source Line 5167 (5120 to 5127)

GPL 1120 to 5120 - PAGSBs, move line N to avoid.
5120 - PAGSB 10' E of station, move station 20' W and drive around to avoid.
Le Conte's thrasher observed near station, avoid large shrubs.
5120 to 5121 - PAGSBs, many burrows, drive to N to avoid.
5123 to 5124 - PAGSBs, many burrows, drive to S to avoid.
5124 - PAGSB, move station to existing rd. to avoid.
5125 - PAGSB, move station 10' E, and drive around to avoid.
5126 - PAGSB, drive 25' N to avoid.

Source Line 5167 (5152 to 5159)

5157 - PAGSB 50' NW of vp, follow flag line closely, PAGSB 20' across road from vp, move vp 10 down line, stack and drive by if possible.
5157.5 - PKFD/badger den, can't avoid by 50', drive by if possible. Kit fox scat in area but not at dens.

Source Line 5167 (5167 5184 to 5166 5190)

Stay on existing oil field roads.

Source Line 5169 (5048 to 5055)

5053 -KKFND (Known kit fox natal den) - approximately 25 ft S of station.
Avoid by driving 125 ft N of line - move vibe point 125 ft back down line or to the N (possible stack)

Source Line 5169 (5080 to 5087)

No resources found.

Source Line 5169 (5112 to 5119)

5116 - PAGSB 45' W of station, follow flags S to avoid by 30'.
5118 - PAGSB 60' E of station, stay on existing rds. N to avoid by 30'.
5119 - PAGSB 45' W of station, other burrows in area, continue from flags around resource at last station to avoid by 30'. Le Conte's thrasher heard along line, drive around large shrubs.

Source Line 5169 (5144 to 5151)

5144 - PAGSB, move pt. up or down rd., stay on rd. to avoid.
5144.5 - PAGSBs, stay on rd. to avoid.
5145.5 - PAGSB, move pt. to rd. if possible, follow flags S to avoid.
5149 - PAGSB, move pt. W to rd. if possible, drive around to avoid by 30'.
5150 - PAGSB, move pt. 30' N to rd.

Source Line 5169 (5176 to 5183)

5178 - PAGSBs (old GKR) 45' W of vp, follow flags S to avoid by 30'.
PAGSB at vp, move vp 30' E or to flag line, follow flags S to avoid by 30'.
5181 - PAGSB/BNLLB 5' E of vp, move vp to existing road, follow flags N from existing road or drive to 5180 on existing roads.

Source Line 5171 (5040 to 4057)

PKFD ca. 15 ft N of line - and 25 ft east near 5045

(second entrance - ca. 9 ft N of line - use existing roads and trails ca. 30 ft S of line)

5435 - pipelines

Source Line 5171 (5170 5072 to 5171 5079)

5172 5075 - PKFD 12' S of station, move station 48' N, follow flags to E to avoid by 50'.

Source Line 5171 (5104 to 5111)

5107.5 - PKFD

5108 - PBNLLB 6' W of station, follow flags S to avoid both, move 5108 24' E or on flagged line.

5111 - Pipelines near station, Le Conte's thrasher near station, drive around large shrubs.

Source Line 5171 (5136 to 5143)

5136 - PAGSB, move pt. S to rd., drive around to avoid by 30'.

5036.5 - PAGSBs, many burrows, biologist/monitor flag avoidance route.

5137 - PAGSB 10' form pt., many burrows, biologist/ monitor flag avoidance route.

5138 - PAGSBs to N and S of line, move to rd. to avoid.

Source Line 5171 (5170 5168 to 5171 5175)

No resources found.

Source Line 5173 (5000 to 5007)

Use oilfield roads and trails

Source Line 5173 (5032 to 5039)

line is in mostly oilfields - use existing roads and trails

Source Line 5173 (5096 to 5103)

5097.5 - PGKRB move line E.,30',back on source 40 ft upline.

5102 - PKFD move line E.,50',back on source line 50' up.

Source Line 5173 (5128 to 5135)

5128 - PAGSB 25' N, move pt. 10' S down access rd., drive around to avoid.

5129 - PAGSB 30' E and 20' W, move pt. up or down existing rd. to avoid if possible.

5131 - Le Conte's thrasher heard nearby, avoid large shrubs.

Source Line 5173 (5173 5160 to 5170 5167)

No resources found.

Source Line 5174 (5056 to 5063)

OK on line

Source Line 5175 (5175 5064 to 5171 5071)

5175 5064 - PKFD 50' W of station and 10' S of line, move station 10' #, follow flags N to avoid by 50' or retrace steps to bare ground area to E.

5172 5069 - Old KFPD area 60' W of station, move station 90' E or S, follow flags to N or stay on rds. and come W on source line

Source Line 5175 (5088 to 5095)

OK on line

Source Line 5175 (5120 to 5127)

5121 - PAGSB 10' W of station, move station 40' S to rd. and drive around to avoid.
5124 - PAGSB 15' E of station, move station 15' W and drive around to avoid.
5124 to 5125 - Drive E to existing rd. to avoid vegetation.
5125 - Le Conte's thrasher heard near pt., avoid large shrubs in area.
5126 - PAGSB near station, move station and line 25' E to avoid.

Source Line 5175 (5175 5152 to 5173 5159)

No resources found.

Source Line 5175 (5174 5184 to 5175 5186)

5186 - PErho on access road to vp. Road on narrow ridge with no alternative route. Drive over PErho or move point.

Source Line 5177 (5048 to 5055)

5048 - 5049 - KF skull at 5048.9 stay on road as possible
5049 - W of line 30 ft (PAGS burrow) - back to trail at 5050
5050 - 5055 - OK on line

Source Line 5177 (5080 to 5087)

5081 - KF den/burrowing owl burrow. Move vibe pt. 150 ft W, follow flagging.
5082 - PGKR burrows. Move line 30 ft W

Source Line 5177 (5178 5112 to 5177 5119)

5178 5112 - PBNLLB 40' E of station, follow flags S to avoid by 30'.
5177 5114 - PAGSB, pipeline 25' W of station, may need to come in from E, move station 30' to flag line, many holes along line from 5144 to 60' W of 5115, follow flags S to avoid by 30'.
5117 5116 - PAGSB 12' W of station and 5' E, many holes, move station 35' E and use from existing rds. Le Conte's thrasher heard along line, drive around large shrubs.

Source Line 5177 (5179 5144 to 5177 5151)

5147.5 - PAGSB, follow flags N to avoid by 30', staying on existing rds. would be better if possible.
5151 - PAGSB, move vibe pt. 30' E or W, stay on existing rds. around.

Source Line 5179 (5008 to 5015)

Use oilfield roads and trails

Source Line 5179 (5040 to 5047)

5040 - 5042 - use existing roads
5042 - 5045 - cross country travel OK
5045 - 5046 - stay on oilfield roads
5046 - 5047 - stay on roads

Source Line 5179 (5072 to 5079)

OK on line

Source Line 5179 (5104 to 5111)

5104 - Le Conte's thrasher heard near station, drive around large shrubs.
5110 - KKFD/BOB 12'/21' N of station (owl observed, lots of kit fox scat at 1st burrow, 3 burrows in all, burrowing owl uses 2), follow flags S to avoid by 100', move station 100' E, W or on flag line. Potential terrain problem - medium sized wash between station and GPL, may want to stay on existing rds.

Source Line 5179 (5136 to 5143)

5136 - flag says 5138, but I think it is station 5136. Line goes up rd. to 5140 and then back on itself and down into wash to get to 5141, staying on rd. would have been a better option.

5141 - Many PAGSB/BNLLBs just W of pt., follow flags around or come in from existing rd. E of pt.

Source Line 5181 (5001 to 5008)

Oilfield stay on existing roads and trails

Source Line 5181 (5032 to 5039)

5032 - 5040 - trucks OK

5039.5 use roads when possible

Source Line 5181 (5064 to 5071)

OK on line.

Source Line 5181 (5096 to 5103)

5098 - PGKRB, move vibe pt. 30' E to road, stay on road to end of line.

5100.5 - PBNLLB, move line 30' S.

Source Line 5181 (5128 to 5135)

5121 - PAGSB 35' W of station, follow flags N to avoid by 30'.

5133 - PAGSB 50' E of station, follow flags S to avoid by 30'.

Source Line 5181 (5187 5184 to 5187 5187)

All vibe points along roads. No resources found.

Source Line 5183 (5016 to 5023)

Travel road beside line

Source Line 5183 (5056 to 5063)

5063-5056 travel along line OK

5056 - PGKR burrow, move vibe point 30 ft E

Source Line 5183 (5088 to 5095)

5092 - PGKRB, move vibe pt. 30' W, follow flags to 5091.

5093.5 - PGKRB, move line 30' N.

Source Line 5183 (5120 to 5127)

5121 - PAGSB 75' W of station, follow flags S along existing rd. to avoid by 30'.

5127 - PAGSB 50' E of station, follow flags N to GPL 1128 to avoid by 30'.

Source Line 5185 (5048 to 5055)

marked as 5145

5053 - badger burrows veer N 35 ft and 50 ft up SL from 1054 up OK for trucks stay on line

Source Line 5185 (5080 to 5087)

5084 - PAGSB, move vibe pt. 10' W.

Source Line 5185 (5112 to 5119)

GPL 1112 to 5112 - Follow flags on existing rd. to access 5112.

5112 - PAGSB 20' E, move station 10' W and drive around to avoid.

5113 - PAGSB 15' N of station, move station 15' W to existing rd. and drive around to avoid.
5114 - PAGSBs at station and 5' E, move station 30' W to existing rd. and drive around to avoid.
5114 to 5115 - Follow flags N to existing rd. to drive between stations.
5115 - PAGSB 10' S of station, move station 35' W to graded area and drive around to avoid.
5116 - PAGSB 25' W of station, move station 5' E and drive around to avoid.
5116 to 5117 - Follow flags S to avoid vegetation and steep terrain.
5117 - PAGSB 40' E, follow flags to avoid by 30'.
5117 to 5118 - Follow flags S to existing rd. to drive between stations.

Source Line 5185 (5144 to 5151)
5149 - PAGSB 10' SW of vibe pt., move pt. 40' W, 25' E or to flag line, follow flag line N to avoid by 30', many holes in area, follow flag line closely.
5150 - PAGSB, move vibe pt. 30' E or W or to flag line, follow flags S to avoid by 30'.

Source Line 5187 (5000 to 5007)
PAGSB at 5004 - use existing road N of line
if not avoid burrow by driving 20 ft S of line
Fence at 5002

Source Line 5187 (5008 to 5015)
Stay on existing dirt and paved roads runs 0 - 15 ft from line

Source Line 5187 (5040 to 5047)
Trucks OK use roads /trails when possible

Source Line 5187 (5072 to 5079)
5077 - PKFD, move line 50' N and follow flags to 5076.

Source Line 5187 (5104 to 5111)
5107 - PAGSB, move station 40' E to existing rd. and drive around to avoid.
5107 to 5108 - Follow flags to existing rd. to drive between pts.

Source Line 5187 (5136 to 5143)
5136 - PAGSBs, move vibe pt. 30' W or to flag line, follow flags S to avoid by 30', many holes in area.
5139 _ PAGSBs all around vibe pt., move pt to flag line to avoid by 30', follow flags S to avoid.

Source Line 5189 (5032 to 5039)
5035.8 - power line tower old red-tailed hawk carcass killed by powerlines

Source Line 5189 (5064 to 5071)
No resources found.

Source Line 5189 (5096 to 5103)
5103 - PKFD, move line 30' E.

Source Line 5189 (5128 to 5135)
5128 - PAGSB 45' W of station, use existing rds. to N to avoid by 30'.
5135 - PBNLLB 70' W of station, follow flags S to avoid by 30'.

Source Line 5191 (5016 to 5023)
Oilfield stay on roads 0 - 15 ft from line

Source Line 5191 (5024 to 5031)
marked 5291 on flag
5031 - 5026 cross country travel OK
5026 - 5024 - travel on existing roads and trails

Source Line 5191 (5056 to 5063)
OK on line

Source Line 5191 (5088 to 5095)
No resources found.

Source Line 5191 (5120 to 5127)
5120 - KKFPD 40' from station, move station to flag line, follow flags N along existing rd. to avoid.
5124 - PAGSB 35' W of station, follow flags S to avoid by 30'.
5126 - PAGSB 75' E of station, follow flags S to avoid by 30'.

Source Line 5193 (5048 to 5055)
OK for cross country travel
5048.5 - use roads if possible

Source Line 5193 (5080 to 5087)
5083.9 - PGKRB, move vibe pt. 5084 15' N.

Source Line 5193 (5112 to 5119)
5112.5 - PAGSB and PKFD N of line, follow flags to avoid.
5113.5 - PAGSB, follow flags to avoid.
5115.5 - PAGSB, follow flags to avoid.

Source Line 5193 (5144 to 5151)
No resources found.

Source Line 5195 (5008 to 5015)
use existing roads and trails

Source Line 5195 (5040 to 5048)
5048 - 5040 - use existing roads and trails to avoid habitat as much as possible

Source Line 5195 (5072 to 5079)
No resources found.

Source Line 5195 (5104 to 5111)
5107.5 - PKFD, follow flags to avoid.
5109.5 - PAGSB, follow flags to avoid.
5110.5 - PAGSB, follow flags to avoid.

Source Line 5195 (5136 to 5143)
No resources found.

Source Line 5197 (5000 to 5007)
starting from GPL 1000 trucks OK use roads if possible
5000.5 AGS burrow veer NE 30 ft up SL 30 ft

5001.5 veer W 30 ft up SL 30 ft to avoid AGS burrow
5003 - Badger and PAGSB, use road to the W 50 ft trucks OK up to 5004

Source Line 5197 (5197 5032 to 5196 5089)
5039 - fence
5039 - 5032 - use roads if possible rodeo arena OK for trucks

Source Line 5197 (5064 to 5071)
No resources found.

Source Line 5197 (5098 to 5103)
5098 - PAGSB 200' W of station, no stations between 5098 and GPL 1096, follow flags S to avoid.
5103 - PAGSB 40' E, follow flags W to avoid.

Source Line 5197 (5128 to 5135)
5133 - PAGSB 60' E of station, follow flags N to avoid by 30'.
5135 - PAGSB 40' W of station, follow flags N to avoid by 30'.

Source Line 5199 (5024 to 5031)
Oilfield stay on existing roads 0 - 5 ft away

Source Line 5199 (5056 to 5063)
5060.2 - pipelines, use roads to cross, then back on line to 5056
5060.3

Source Line 5199 (5088 to 5095)
5091.5 - PBNLLB, move line 30' S, back on line at 5092.
5094 - P???B, move line 20' S.

Source Line 5199 (5120 to 5127)
No resources found.

Source Line 5201 (5016 to 5023)
Most of line 5201 is in intensive oilfield
use existing roads and trails as feasible

Source Line 5201 (5048 to 5055)
5048 - 5055 - roads and trails
5052 - pipelines roads and trails

Source Line 5201 (5080 to 5087)
No resources found.

Source Line 5201 (5112 to 5119)
5117 - PAGSB 30' W of station, follow flags N to avoid by 30'.
5118 - Wash with small leaking pipe fed stream just W of station, avoid if possible.

Source Line 5201 (5144 to 5151)
5145 - PKFD 50' E of station, follow flags N to avoid by 50'.
5149 - PAGSB 15' E of station, move station 15' W or to flag line, follow flags N to avoid by 30'.

Source Line 5203 (5008 to 5015)

5009-5011 - stay on adjacent road going uphill as feasible

Source Line 5203 (5040 to 5047)

5040 - 5047 - residential roads and trails

Source Line 5203 (5072 to 5079)

5075.5 - PGKRB, move line 30' N, back to line at 5075.

Source Line 5203 (5104 to 5111)

5104 - PAGSB about 30' W of station, follow flags N to avoid by 30'.
5105 - PAGSB about 18' S of station, move station 12' N or onto flag line.
5106 - 2 PKFDs and 1 PBNLLB on route down into wash from 5106 to 5107, follow flags to avoid, find alternate route if possible, 5106 is next to a rd.

Source Line 5203 (5136 to 5143)

No resources found.

Source Line 5205 (5000 to 5007)

5007 - vibes okay on line as terrain allows - use 4x4 trail from W of 5000 to enter and exist from this line (steep terrain)

Source Line 5205 (5206 5032 to 5204 5039)

5032 - 5034 - roads / trails
5034 - 5039 - residential

Source Line 5205 (5096 to 5103)

5096 to 5101 - OK on line.
5098.5 - PGKRB, move line 30' S and 50' up line.
5101.2 - PKFD, move line 50' W of flags, move vibe pt. 5101 20' W.
5102.5 - Badger Den/PKFD, move line 50' E.
5102.5 to 5103 - hilly terrain

Source Line 5205 (5128 to 5135)

No resources found.

Source Line 5207 (5056 to 5063)

No resources found.

Source Line 5207 (5088 to 5095)

5094 - PGKRB, move line 50' N and 40' up line.

Source Line 5207 (5120 to 5127)

5120 - PKFDs (2) 15' S of station, move station 50' E, W or to flag line, follow flags N to avoid by 50'.

Source Line 5209 (5290 5080 to 5208 5087)

No resources found.

Source Line 5209 (5112 to 5119)

5114 - PAGSB about 48' E of station, follow flags N to avoid by 30'.

Source Line 5209 (5144 to 5151)

5147 - PKFD 15' W of station, follow flags N to avoid by 50'.

Source Line 5211 (5008 to 5015)

5211 - 5013 and 5211/ 5010 OK
5211/ 5010 and 5009 RSE
541 - 5009

Source Line 5211 (5212 5043 to 5211 5047)

residential 1040
up to 5042.5 on hwy.
the actual 1st station is 5212 at 5043 roads/trails
5044.5 use roads from 5042.5 to 5048 use roads as much as possible stay on line

Source Line 5211 (5072 to 5079)

5075 - PGKRB, move vibe pt. 30' W.

Source Line 5211 (5104 to 5111)

No resources found.

Source Line 5211 (5136 to 5143)

5141 - PAGSB 5' E of station, move station 25' W or out to flag line, follow flags N to avoid by 30'.

Source Line 5213

5000-5004 - vibes online okay
5004 - drive 50 ft S to avoid BOB in bank of drainage at 5005.8
5006.2 - vibes back to line
5006.9 - drive 20 ft S of PAGSB to EOL

Source Line 5213 (5032 to 5039)

5032.5 - badger burrows veer W 10 ft or use trails and roads W to maneuver at brush and trees as much as possible up to 5042 (runs past GPL 1040)
5038.5 - use roads

Source Line 5213 (5213 5064 to 5214 5071)

5214 5070 - PKFD (pipe), move line 50' S.
5214 5071 - Le Conte's thrasher near this pt. avoid shrubs in this area.

Source Line 5213 (5096 to 5103)

5096 - PGKRB, move line 30' E and back to line at 5096.5.

Source Line 5213 (5128 to 5143)

No resources found.

Source Line 5215 (5024 to 5027)

Avoid pipeline at 5027
Road parallels line from this point to geophone line
stay on road where possible

Source Line 5215 (5056 to 5063)

OK on line

Source Line 5215 (5088 to 5095)

5093.5 - PBNLLB, move line 30' S and back to line at 5094.

Source Line 5215 (5120 to 5127)

No resources found.

Source Line 5217 (5016 to 5023)

5016 - use road to access SL and then cross country to 5017-5018 - drive 30 ft N of SL to avoid PAGSB
5024 to 5023 to 5022 (fence) - use adjacent road (0-30 ft S of source Line). Vibes access SL using oilfield storage yard to 5019 and then E-W along SL as terrain allows or vibe on existing roads and trails.

Source Line 5217 (5048 to 5055)

5048 - 5052.9 - cross country travel stay on roads as possible
5052.9 - 50 ft E of line (PKFD)
5052.9 - 5054 - drive 50 ft E of line
5054 - 5055 - use existing roads and trails

Source Line 5217 (5080 to 5087)

No resources found.

Source Line 5217 (5112 to 5119)

No resources found.

Source line 5217 (5144 to 5151)

5144 - PKFD 15' E of station, follow flags S to GPL 1144 to avoid by 50'.

Source Line 5219 (5008 to 5015)

5009 - okay along line as terrain allows (steep)
5011 (road) - 5013-5015 - road okay
5014 - PKFD in side of roadcut along RSE - avoid by 50 ft

Source Line 5219 (5040 to 5047)

Cross country on line OK

Source Line 5219 (5072 to 5079)

No resources found.

Source Line 5219 (5104 to 5111)

No resources found.

Source Line 5219 (5136 to 5143)

No resources found.

Source Line 5221 (5032 to 5039)

5032 - 5033 - stay on existing roads and trails
5033 - 5034 - cross country OK
5034 - 5035 - on existing roads
5035 - 5039 - cross country OK

Source Line 5221 (5064 to 5071)

No resources found.

Source Line 5221 (5096 to 5103)

5100 - PBNLLB, move line 16' N.
5101.5 - PBNLLB, move line 30' S.

Source Line 5221 (5128 to 5135)

No resources found.

Source Line 5223 (5024 to 5031)

5031-5030 - RSE - vibes okay
5028-5024 - use adjacent road and trails along source line - (ca. 0-10 ft from SL)

Source Line 5223 (5056 to 5063)

OK on line

Source Line 5223 (5088 to 5095)

5091.5 - PKFD (pipe), move line 40' N.

Source Line 5223 (5120 to 5127)

No resources on line.

Source Line 5225 (5016 to 5023)

5016 - okay to road
5017 - vibes use dirt road ca. 0-60 ft S of SL (PGKRB) to top of knoll hill and then to PL N of GPL 1020
5022-5023 - vibes okay along line or use adjacent road E of SL

Source Line 5225 (5048 to 5055)

5055 - 5048 - keep on oilfield roads and trails (around pipes, brush, trash)

Source Line 5225 (5080 to 5087)

5085.25 - Pipeline crosses line.
5085.5 - PBNLLB, move line 30' N.

Source Line 5225 (5112 to 5119)

5115 - PKFD ca. 50' E of station, follow flags N to avoid by 30'. Wash between station and geophone line

Source Line 2225 (5144 to 5151)

No resources found.

Source Line 5227 (5229 5008 to 5227 5015)

1012 1227 - PAGS 18 ft W on 5228 5012.5 avoid to W of 1012 12 and 30 ft N of 5228

Source Line 5227 (5227 5040 to 5226 5047)

Stay on oilfield roads if possible

Source Line 5227 (5228 5072 to 5227 5079)

5077.5 - Pipeline crosses line. No resources found.

Source Line 5227 (5104 to 5111)

5104 - Badger Den about 50' W of station, follow flags S to avoid by 30'.
5105 - KKFD 60' E of station, move station 40' W or onto flagged line. Multiple holes but no puppy scat, old adult scat present, badger sign in one hole. Another badger sized den 15' from station.

Source Line 5227 (5136 to 5143)
No resources found.

Source Line 5229 (5000 to 5007, includes 5229 5011)
5001 - PAGS just W avoid 30 ft to S
5005.5 - PAGS drive 15 to S between 5005 and 5006
5007 - PKF 18' N of 5007 avoid 12 ft to S of line
5011 - PKF, avoid 50' to N

Source Line 5229 (5032 to 5039)
5063-5056 OK on line
5039 - 5032 - use trails / roads as needed to avoid habitat as much as possible

Source Line 5229 (5064 to 5071)
No resources found.

Source Line 5229 (5096 to 5103)
No resources found.

Source Line 5229 (5128 to 5135)
No resources found.

Source Line 5231 (5229 5024 to 5231 5031)
5024-5025 - use dirt road inside of fence (PKFD/PAGSB/BOB along SL) 5025-5027 - on road okay
5031/5027 (on road) - 5031 (paved road) - vibes okay on line - use old road and well pad at 5029-5030
5030 - PAGSB 30 ft from line - vibes okay along line

Source Line 5231 (5231 5056 to 5233 5063)
OK on line.

Source Line 5231 (5088 to 5095)
5089.5 - PBNLLB, move line 30' N.
5094.5 - PBNLLB, move line 30' N.

Source Line 5231 (5120 to 5127)
5122 - PAGSB 35' E of station, follow flags N to avoid by 30'.

Source Line 5233 (5018 to 5025)
5233 5022 - fence just W.

Source Line 5233 (5235 5048 to 5232 5055)
Stay on existing roads and trails if possible, cross country OK if it is a must.

Source Line 5233 (5080 to 5087)
5080.5 - PBNLLB, move line 30' N.
5084.5 - Badger Den, move line 50' N.
5085.5 - PBNLLB, move line 30' N.

Source Line 5233 (5112 to 5119)
5114 - PAGSB about 55' W of station, follow flags N to avoid by 30'.
5115 - PAGSB about 30' W of station, stay on existing rds to avoid by 30'.

Source Line 5235 (5040 to 5047)

5040 - 5042 - drive on road E of line
5042 - 5045 - drive in grassy areas W of line avoid shrubs
5045 - 5047 - use existing roads

Source Line 5235 (5072 5o 5079)

5079.5 - PGKRB, move line 30' S.

Source Line 5235 (5104 to 5111)

No resources found.

Source Line 5237 (5000 to 5007)

5007 - stay on existing trail about 30 ft SE of SL
truck OK up to GPL 1000

Source Line 5237 (5032 to 5039)

Stay on roads and trails

Source Line 5237 (5237 5064 to 5235 5071)

Pipe and utility yard, no resources found.

Source Line 5239 (5024 to 5031)

5239 5030 - starting out of oilfield

Source Line 5239 (5056 to 5063)

5056.5 drive 20 ft N to avoid PAGS burrows
5056-5063 OK on line

Source Line 5241 (5016 to 5023)

5241 5023 - PKFD - avoid 50 ft to N of line

Source Line 5241 (5240 5048 to 5241 5055)

5040 - 5048 work with truck S on this drive numerous burrows
5055 - PAGSB 9 ft N of 5055 - avoid by driving 20 ft S of line

Source Line 5243 (5008 to 5016)

5008 - trucks OK stay on road as much as possible

Source Line 5243 (5040 to 5047)

5047 - PKFD (Pipe) 15 ft E of station, avoid by driving 25 ft W of steamline

Source Line 5243 (5072 to 5079)

No resources along SL - travel along line okay as terrain allows

Source Line 5245 (5000 to 5007)

GPL 1000 - source line begins at 1245 use road and trails as much as possible
AGS burrow at 5006 - use existing trail 30 ft N and 30 up from marker

Source Line 5245 (5032 to 5039)

5032 - PAGSB near intersection with GPL 1032.

Source Line 5247 (5024 to 5031)

5247 5026 - PKF dens (pipes) 18 ft S of line avoid 50 ft to N pipeline
at 5247 5029.5 oilfield use existing rds.

Source Line 5247 (5056 to 5063)

5063-5056 OK on line

Source Line 5249 (5016 to 5023)

5024 - vehicles OK use trails and roads as much as possible to avoid brush
5021.5 - AGS burrow use road to the NE to maneuver at 30 ft to side and 30 ft up SL fence at 5020
AGS burrow 30 ft SE of 5020 veer E at 30 ft and up SL 30 ft to avoid
OK up to 5016

Source Line 5249 (5048 to 5055)

5048 - OK on line
5249 - 5053 vibe on road 20 ft N
5051-5053 - no resources - travel along SL okay as terrain allows

Source Line 5251 (5008 to 5015)

1008 - GPL - at 1251 - source turns into 5250 then back to 5251 again at GPL 1014 - trucks OK all the way to GPL 1016 as terrain allows

Source Line 5251 (5040 to 5047)

5041 - move to RSE if possible
5042 - move to RSE if possible
5043 - move to RSE if possible
5044 - move to RSE if possible
5045 - move to RSE if possible
5046 - move to RSE if possible

Source Line 5253 (5000 to 5008)

5007 - 5005 - cross county OK stay on roads as possible
5005 - 5000 - on roads as possible

Source Line 5253 (5032 to 5039)

5038 - PKFD 25' W of station follow flags to existing rd. N of line.

Source Line 5254 (5056 to 5063)

OK on line

Source Line 5255 (5024 to 5031)

5027 - 5031 use available roads and trails stay on line OK up to 5024

Source Line 5257 (5257 5048 to 5256 5055)

5055, 5258 - 5054, 5257 - 5053 this point is in habitat, others on road, can this be relocated to RSE?

Source Line 5257 (5016 to 5023)

Begin from GPL 1016 at 5257 - trucks OK if possible
Follow SL - steep arroyo at 5017
Badger dig/den at 5018.5 - veer W 50 ft and reconnect W of source 50 ft up line. (AGS burrow) at 5019.5 and adjacent to badger den/dig - veer SW 30 ft of AGS burrow and 30 ft from badger den/dig - buffer of 50

ft overlaps with above veer 20 ft to SW and line up 50 ft past badger burrow
5021.5 - barbed wire fence
AGS burrow veer to E at 30 ft 5022.75 and up SL 30 ft
OK up to GPL 1024

Source Line 5259 (5008 to 5015)
5008 - 5009 - hilly terrain cross country OK
5009 - 5015 - OK on line

Source Line 5259 (5040 to 5047)
5046.7 - PKFD 5 ft S of line, vibe 30 ft N of line on road

Source Line 5261 (5001 to 5007)
5001 - drainage trucks drive 100 ft E of line to avoid (1st flag is 5261- 5001)
on line travel Ok
5006 - roadway to line cross country travel OK

Source Line 5261 (5032 to 5039)
No resources, stay on rds. if possible.

Source Line 5263 (5262 5024 to 5263 5031)
Come into source line 1263 at GPL 1024 avoid AGS burrow by staying on the road to the E 30 ft up SL 30 ft (marks from here on are candy stripe flagging only
AGS burrow 1027 use road 30 ft to NW and up SL 30 ft
5027.75 - use road ahead 70 ft. Badger burrow at 5030.5 use road to SE at 100 ft to allow you to maneuver your way back to source through the brush 50 ft up SL from burrow at 5031
5031.5 - use roads available

Source Line 5263 (5063 5056 tp 5068 5063)
5065-5061 rough terrain, OK on line as needed
5061-5056 OK on line

Source Line 5265 (5048 to 5055)
5051.5 - pipeline
5049.5 - pipeline
In oilfield - use existing roads and trails as feasible
5048 - PAGSB, stay on existing roads or avoid burrow by driving 30 ft N of line

Source Line 5265 (5016 to 5023)
Use existing road where possible

Source Line 5267 (5268 5040 to 5267 5048)
5042.5 - pipelines
5045.5 - pipelines

Source Line 5269 (5032 to 5039)
5039 - PAGSB 10 ft W of 5039 - move vibe point 20 ft E or 30 ft N drive around 30 ft N of line

Source Line 5271 (5024 to 5031)
5031 - Badger den at 5027.3 stay on existing road E of line
5024 cross country travel OK

ft overlaps with above veer 20 ft to SW and line up 50 ft past badger burrow
5021.5 - barbed wire fence
AGS burrow veer to E at 30 ft 5022.75 and up SL 30 ft
OK up to GPL 1024

Source Line 5259 (5008 to 5015)
5008 - 5009 - hilly terrain cross country OK
5009 - 5015 - OK on line

Source Line 5259 (5040 to 5047)
5046.7 - PKFD 5 ft S of line, vibe 30 ft N of line on road

Source Line 5261 (5001 to 5007)
5001 - drainage trucks drive 100 ft E of line to avoid (1st flag is 5261- 5001)
on line travel Ok
5006 - roadway to line cross country travel OK

Source Line 5261 (5032 to 5039)
No resources, stay on rds. if possible.

Source Line 5263 (5262 5024 to 5263 5031)
Come into source line 1263 at GPL 1024 avoid AGS burrow by staying on the road to the E 30 ft up SL 30 ft (marks from here on are candy stripe flagging only
AGS burrow 1027 use road 30 ft to NW and up SL 30 ft
5027.75 - use road ahead 70 ft. Badger burrow at 5030.5 use road to SE at 100 ft to allow you to maneuver your way back to source through the brush 50 ft up SL from burrow at 5031
5031.5 - use roads available

Source Line 5263 (5063 5056 tp 5068 5063)
5065-5061 rough terrain, OK on line as needed
5061-5056 OK on line

Source Line 5265 (5048 to 5055)
5051.5 - pipeline
5049.5 - pipeline
In oilfield - use existing roads and trails as feasible
5048 - PAGSB, stay on existing roads or avoid burrow by driving 30 ft N of line

Source Line 5265 (5016 to 5023)
Use existing road where possible

Source Line 5267 (5268 5040 to 5267 5048)
5042.5 - pipelines
5045.5 - pipelines

Source Line 5269 (5032 to 5039)
5039 - PAGSB 10 ft W of 5039 - move vibe point 20 ft E or 30 ft N drive around 30 ft N of line

Source Line 5271 (5024 to 5031)
5031 - Badger den at 5027.3 stay on existing road E of line
5024 cross country travel OK

Source Line 5271 (5056 to 5063)
OK on line

Source Line 5273 (5274 5018 to 5272 5023)
5018 - 5021 - travel on line OK
5021 - 5022 - crypto soils much Erho - drive 50 ft W of line (finish at 5022)
lots of Erho in old roadway
5022 - 5023 avoid flagged areas

Source Line 5273 (5048 to 5055)
5048 - 5050.5 - OK
5050.5 - AGS burrow veer E 30 ft up SL 30 ft OK up to 5255

Source Line 5275 (5277 5032 to 5275 5039)
Use oilfield roads and trails

Source Line 5279 (5280 5026 to 5279 5031)
5031 - 5026 use existing ATV trails at flagging drive 30 ft N of line to finish
5028 - 5026 (BOL) last flag - fence at 5027.5

Source Line 5279 (5056 to 5063)
Oil Field, cross country OK. Use roads when possible

Source Line 5281 (5048 to 5055)
Use oilfield roads and trails

Source Line 5283 (5285 5040 to 5283 5047)
Use oilfield roads and trails

Source Line 5285 (5280 5033 to 5279 5032)
Established oilfield roads trucks stay on rds.

Source Line 5287 (5056 to 5063)
5056-5057 use existing roads and trails
5057-5061.2 badger dig/PKF den, follow flags to get back to line
5061.5-5063 OK on line

Source Line 5289 (5290 5048 to 5089 5055)
Travel on existing roads if possible
5050 - PAGSB (road is 50 ft W)

Source Line 5291 (5044 to 5047)
at GPL 1040 line ends at 5044.
5047 to 5044 - 50 ft E of line use existing roads and disturbed areas

Source Line 5295 (5056 to 5063)
Oil field, cross country along lines OK. Use roads when possible

Source Line 5297 (5053 to 5055)
Use old roadway and disturbed areas, avoid shrubs, line ends at 5053.
Oil field, cross country along lines OK. Use roads when possible

Source Line 5303 (5061 to 5063)

Oil field, cross country along lines OK. Use roads when possible

Source Line 5311 (5310 5058 to 5311 5063)

Oil Field, use existing roads and trails

SL 5191 (5191-5184)

5191 old KF den (inactive) 25' SE of VP. Monitor should check before travel.
5190 pipeline
5188 hill, too steep for vibes. New drive around OK
5186 KF den #96-11 (inactive).
PAGS burrows on two track along hill top

SL 5199 (5191-5184)

5184 hill, probably too steep for vibes
5185 old two track
5186 road
5191 road

SL 5207 (5191-5184)

5187 pipeline
5190 pipeline

SL 5215 (5191-5184)

5186 PBNLL 100' N of VP
SL 5223 (5191-5184)
Line runs along road around old sump area between 5186-5185. Many SNKR burrows on line (unflagged).

SL 5231 (5191-5184)

5189 hill, too steep for trucks.
Old KF den (inactive)100' S of VP
Old KF den (inactive) on new drive around
5184.5 PAGS and SNKR burrows
5184 PKF den (inactive) 20' N of VP

SL 5239 (5191-5184)

5184 KF den
5182.5 Cryptogamic crust, with lots of burrows (unflagged)
5187 KF den 80' SW of VP. Lots of Cryptogamic soil all along SL
SL 5247 (5191-5184) No listed resources along line
SL 5177 (5183-5176)
5177 road
5179 road and pipeline
5183 road

SL 5185 (5183-5176)

5183-5180 road along line
5178 PGKR burrows (inactive) 30' N of VP on line.
GKR precinct (active) occupied by HKR. 20' E of VP
5177 PGKR hole (some used by HKR) 40' SW of VP
5176 road

SL 5193 (5183-5176)

5183 Cryptoganic crust on line (no way to avoid)
5182 EHKF den #15B-26 (inactive) 100' E of VP - road
5180 follow old two track

SL 5201 (5183-5176)

5177.75 PKF den (inactive) 40' W of 5178
5179 hill, too steep for vibes

SL 5209 (5183-5176)

Hillside, very erratic and steep. Restricted to roads over most of line. No listed resources on line.

SL 5217 (5183-5176)

5176 hill, gets steep. PBNLL habitat

SL 5225 (5183-5176)

5177 road
5178.3 Badger dig on line. PAGS burrows (mostly occupied by SNKR)

SL 5233 (5183-5176)

5183 couldn't find VP
5182 old GKR burrows on line. Occupied by SNKR (flagged anyway)
5180-5178 wash, follow flags to cross

SL 5241 (5183-5176)

Line with lots of Cryptogamic soil, may require monitor
5179.5-5180 Crypto crust (unflagged)
5180 PGKR burrows

SL 5249 (5183-5176)

5182.5 wash. May be too rough for trucks
5182 KF den 100' W of VP
5179.5 Move flag over 20' W to avoid sensitive area
5177 PGKR burrows (old) 30' S of VP

SL 5289 (5183-5176)

No listed resources on line

SL 5297 (5183-5176)

5179 road
5178 wash, with new drive around. BOB on new drive around, 75' W of line (in bank)

SL 5307 (5183-5176)

5180 road, hill. Terrain not a problem

SL 5313 (5183-5176)

5179 Hill, too steep for vibes. Road E
5178 road

SL 5321 (5183-5176)

No listed resources on line

SL 5329 (5183-5176)

5179 KF den (inactive) 50' NW of VP
5182-5183 wash
5183 KF den 160' W of VP

SL 5337 (5183-5176)

steep, grassy hillside.
5178 Cryptogamic crust with some burrows (umflagged) 20' SW of VP
5177 Badger dig/PKF den 50' E of VP

SL 5179 (5175-5168)

5174.5 pipeline
Cryptogamic crust along line. No listed resources

SL 5187 (5175-5168)

5169 KF den (active) 30' SW of VP

SL 5203 (5175-5168)

5168-5171 road

SL 5211 (5175-5168)

5168 GKR burrows on line. Recommend E route
5171 drainage, too steep for vibes
5171.5-5175 Cryptogamic crust, with lots of burrows
5174.5 Badger dig/PKF den 80' N of VP

SL 5219 (5175-5168)

5173 PBNLL burrows 10' W of VP
5173.25 road
5168-5169 PBNLL burrows E of road (unflagged)

SL 5227 (5175-5168)

5170.5 road
5171 wash, drive around OK
5173.5 PKF den on line

SL 5235 (5175-5168)

Lots of small burrows on line.
5172 SNKR burrows on hilltop. Old two track
5170 Old GKR burrows, and KF den on line (both inactive) 40' W of VP. Drive around OK

SL 5243 (5175-5168)

5172 many burrows around wash.
5173.75 road

SL 5251 (5175-5168)

5174 PGKR burrows 80' S of VP
5172.5 drainage, may be difficult for vibes

SL 5291 (5175-5168)

Line runs along hilltops.
5168-5169 two track
No listed resources on line

SL 5299 (5175-5168)

Steep hill, may be too steep for trucks. No listed resources on line.

SL 5307 (5175-5168)

5169 wash, runs W along line
5172 line crosses wash. May be too rough for trucks.
5172-5174 Wash

SL 5323 (5175-5168)

5189 road
5174.2 PKF den on line (inactive).

SL 5331 (5175-5168)

5174-5175 steep terrain
5174 KF den (active) approx. 12 openings 15' N of VP. Recommend E route

SL 5339 (5175-5168)

5176 HKR burrow 20' S of VP (unflagged)
No listed resources. Good truck route

SL 5181 (5167-5160)

5166 PKF den on line (inactive) 20' N of VP
PKF den on line (inactive) 20' S of VP
5165.5 road
5163 two track
5162-5161 road

SL 5189 (5167-5160)

5160.4 wash
5161.5 two track
5164 road
5165.3 wash

SL 5197 (5167-5160)

5161 PGKR burrows 50' SW of VP
5163 PGKR burrows SW of VP

SL 5205 (5167-5160)

No listed resources on line.

SL 5213 (5167-5160)

5167 road
5165-5163 road
5160.5 road

SL 5221 (5167-5160)

5160 road 25' E of line
5163 road
5165.3 PKF den on line (inactive) 50' N of VP. Follow flags to avoid.
5165.8 wash

SL 5229 (5167-5160)

BNLL habitat. Lots of Cryptogamic crust and burrows. Monitor necessary

SL 5237 (5167-5160)

Crytogamic crust on line. Lots of burrows. No listed resources on line

SL 5245 (5167-5160)

5162 two track
5162.5 PBNLL burrows on line
5164.5 wash
5165.2 old two track

SL 5253 (5167-5160)

5160.5 wash, may be too steep for trucks
Many small burrows on line. No listed species on line

SL 5261 (5167-5160)

5167-5165 Cryptogamic crust with lots of burrows. Monitor should check
5162 PAGS burrows

SL 5269 (5167-5160)

5162-5160 rough terrain
5165-5167 Cryptogamic crust 50' S of VP. Lots of burrows
5167 Arch site. Drive around in either direction

SL 5277 (5167-5160)

5167 wash, runs SE of line
5166 wash, trucks can cross OK
5165 two track
5163.5 wash
any small burrows. No listed resources on line

SL 5285 (5167-5160)

5159.5 wash
5162.5 wash, too steep for trucks. Scouts and monitor will have to find crossing.
5165 wash, follow new drive around

SL 5293 (5167-5160)

Rough terrain. No listed resources on line.

SL 5301 (5167-5160)

5160.25 wash
5163.25 two track
5164 KF den (inactive) Partially collapsed, lots of old scat present. 35' S of VP

SL 5309 (5167-5160)
5162.5 bladed trail
5166-5167 No flags present

SL 5317 (5167-5160)
5166.5 vertical pipe (flagged)
5166-5161 rough terrain
5161.5 wash

SL 5325 (5167-5160)
5167 badger dig/PKF den (inactive) on line 10' S of VP
5163 two track. Badger dig/PKF den on line (inactive)

SL 5333 (5167-5160)
5164.4 badger dig/PKF den (inactive) on line

SL 5341 (5167-5160)
5162.5 two track
5165 PKF den (inactive) 10' E of VP, monitor should check before travel

SL 5349 (5167-5160)
5166.75 pipeline
5163 two pipelines

SL 5183 (5159-5152)
5158 wash
5156 hill, too steep for vibes
5154 wash

SL 5191 (5159-5152)
5155 PKF den (inactive) 40' W of VP
PKF den (inactive) at VP
PGKR burrows at VP

SL 5199 (5159-5152)
5153 PGKR burrows, PKF den 12' N of VP
5157 Cryptogamic crust 30' S of VP

SL 5207 (5159-5152)
5157 GKR 12' NE of VP
5154 KF den 60' from VP

SL 5215 (5159-5152)
5156 road. Badger dig beside road. Not big enough for KF

SL 5223 (5159-5152)
5152 road
5153 road
5157.2 KF den (inactive) 25' N of VP

SL 5231 (5159-5152)
No listed resources on line.

SL 5239 (5159-5152)
5158 PGKR burrows 100' NE of VP
5156 PBNLL burrows 85' NE of VP

SL 5247 (5159-5152)
5154.5 road

SL 5255 (5159-5152)
5157.5 Wash
5154.2 road. Some small burrows on line.

SL 5263 (5159-5152)
5158.5 road

SL 5271 (5159-5152)
5159-5160 Arch site. Drive on E side of SL

SL 5279 (5159-5152)
5154 wash, very small.
No listed resources on line

SL 5287 (5159-5152)
5156.5 PKF den (inactive) on line. two entrances
5157.3 wash, too steep for trucks. Follow new drive around flagging

SL 5295 (5159-5152)
5153 KF den (inactive) Six vents. Travel on either side of avoidance flagging.

SL 5303 (5159-5152)
No listed resources on line

SL 5311 (5159-5152)
Easy travel. No listed resources on line

SL 5319 (5159-5152)
Easy travel. No listed resources on line

SL 5327 (5159-5152)
5154 road
5153.5 wash, too rough for trucks. No listed resources on line

SL 5335 (5159-5152)
5152 two track 20' SE on line
5154.1 PKF den in old pipe (active)
5154.5 pipeline
5155 two track
5156 road
5157 road

SL 5343 (5159-5152)

5156 two track
No listed resources on line

SL 5331 (5143-5136)

Many pipelines
5137.5 road and pipeline
5142 two track
No resources on line

SL 5323 (5143-5136)

5142 two track
5138 wash
5137 drive around OK -road
5136 road
No resources on line

SL 5315 (5143-5136)

No resources on line

SL 5307 (5143-5136)

5142 pipeline
No resources on line

SL 5299 (5143-5136)

5142.75 two track
No resources on line

SL 5291 (5143-5136)

5140 two track
No resources on line

SL 5283 (5143-5136)

5139.25 deep arroyo. too difficult for trucks
5140 road
No resources on line

SL 5275 (5143-5136)

5143 arroyo, too steep for vibes
5140 PBNLL/GKR burrows 100' W of VP
5136 wash
Many Cryptogamic crusts, with burrows on line.

SL 5267 (5143-5136)

No resources on line

SL 5259 (5143-5136)

5138 wash
No resources on line

SL 5251 (5143-5136)
5137 two track
No resources on line

SL 5243 (5143-5136)
5140.5 road
5137.5 wash
No resources on line

SL 5235 (5143-5136)
No resources on line

SL 5333 (5135-5128)
5135 road
5133.5 road
5132 end of rack

SL 5325 (5135-5128)
Arch site at GPL 1136
5134.3 pipeline
5130 road
no resources on line

SL 5317 (5135-5128)
No resources on line

SL 5309 (5135-5128)
5130 road
5132.75 road
No resources on line

SL 5301 (5135-5128)
No resources on line

SL 5293 (5135-5128)
5128 wash
No resources on line

SL 5285 (5135-5128)
5133 PKF den 12' SW of VP

SL 5277 (5135-5128)
5129.5 wash
No resources on line

SL 5269 (5135-5128)
5135 PKF den 120' SW of VP
5133 badger/PKF den (no pin flag) 30' W of SL
5132 road
5131 PBNLL 100' S of VP
5130-5128 Cryptogamic soils

SL 5261 (5135-5128)
No resources on line

SL 5253 (5135-5128)
5134 road
5134-5133 Cryptogamic soils- monitor needed
5128 road and pipeline

SL 5245 (5135-5128)
5128-5129 road
5129 badger/PKF den 80' NW of VP (active)
5130 wash, too steep for vibes
5131-5135 Cryptogamic soils

SL 5237 (5135-5128)
rough terrain
5132 PBNLL burrows. 60' S of VP
5132.75 wash

SL 5327 (5127-5120)
5126.3 two track
5126 Cryptogamic soils around VP
5124 road
5123 end of rack

SL 5319 (5127-5120)
5126.5 road
5121.75 pipeline
5120 pipeline
No resources on line

SL 5311 (5127-5120)
5120 pipeline
5122.5 ditch
No resources on line

SL 5303 (5127-5120)
5127-5125 washes
5124 road
No resources on line

SL 5295 (5127-5120)
5127 wash
No resources on line

SL 5287 (5127-5120)
5120 road
No resources on line

SL 5279 (5127-5120)

5120-5122 Cryptogamic crusts
5121 small wash
5125 fence, opening 100' E of VP
5126 road. PKF den in arroyo on drive around
5127 Cryptogamic crusts with many small burrows

SL 5271 (5127-5120)

5127 fence
5121 wash
Drive around may be difficult for vibes
No resources on line

SL 5263 (5127-5120)

5120.75 BOB burrow on line
5120 two track, and pipeline
Cryptogamic soils on line.

SL 5255 (5127-5120)

5124 road
No resources on line

SL 5247 (5127-5120)

5123 PKF den 100' S of VP. Drive W of avoidance flagging
5124 PKF den 80' S of VP. Wash. Drive around may be difficult
5124.5 two track. Lots of cryptogamic crust

SL 5321 (5119-5112)

5114.5 road and pipeline
5117 road

SL 5313 (5119-5112)

5117 road
5115 road
No resources on line

SL 5305 (5119-5112)

5114 wash, drive around OK
5116.6 road
No resources on line

SL 5297 (5119-5112)

5116 two track
No resources on line

SL 5289 (5119-5112)

5119-5118 road and pipeline
5116-5112 sump
No resources on line

SL 5281 (5119-5112)

5113 pipeline and road
No resources on line

SL 5273 (5119-5112)

Many small burrows on line
5113 pipeline
5114.5 road and pipeline
5115 wash, PBNLL burrows. Avoid flagging. Old BOB in bank of wash
5118 wash, drive around OK. Collapsed KF den on line. Drive by OK

SL 5265 (5119-5112)

5112-5115 line runs along road on NW side of sump

SL 5257 (5119-5112)

No resources on line

SL 5249 (5119-5112)

Cryptogamic crust with many burrows. Needs monitor to guide through
5116-5112 road

SL 5241 (5119-5112)

Cryptogamic crust along line. Drive with caution. Many small burrows along line
5112.5 trench
5118.5 pipelines

SL 5233 (5119-5112)

5118.5 road
5118 road
5117 Cryptogamic crust. Wash
5116.25 pipeline
5115 road
5114.75 pipeline
5113 badger/PKF den 100' N of VP

SL 5225 (5119-5112)

5112 wash
5113 pipline
5115 PAGS burrows
5116 road

SL 5217 (5119-5112)

5116.5-5113 road
5113.25 pipeline
No resources on line

SL 5315 (5111-5104)

5105 pipeline
No resources on line

SL 5307 (5111-5104)

5111-5107 pipe yard
5106 wash
5104.5 wash/PKF den

SL 5299 (5111-5104)

5104.5 pipeline and road
5106-5107 raised pipeline. Drive route unclear
5111 deep wash

SL 5291 (5111-5104)

5111-5107 pumping station, use roads
5106.75 two track
5105 road

SL 5283 (5111-5104)

5104.25 two track
5105.2 road
5106.5 road, and wash. Drive around OK

SL 5275 (5111-5104)

5107 road
5104.5 two track

SL 5267 (5111-5104)

5106 road
5108 road
No resources on line

SL 5259 (5111-5104)

5108.8 PBNLL burrows. Use road 25' SE to avoid
5108 pipeline and road
5104.75 two track
5104 roads

SL 5251 (5111-5104)

5108.1 road
No resources on line

SL 5243 (5111-5104)

5104 Cryptogamic crust 35' N of VP
5104.5 road
5106-5111 Cryptogamic crust- needs monitor
5110 badger dig/PKF den 12' S of VP

SL 5235 (5111-5104)

5109 pipeline
5108.75 pipeline
5108.5 pipeline
5108 road
5107 road

SL 5227 (5111-5104)

5107.25 pipeline
5107.75 old KF den
5108 road

SL 5325 (5103-5096)

Many oil field pipelines, roads, and trails
No resources on line

SL 5317 (5103-5096)

5099 pipeline
5100.5 wash
5100.8 pipeline
5101 road
5101.75 pipeline
5102.75 wash

SL 5309 (5103-5096)

5102 Arch site
5099 pipeline
5097 PAGS

SL 5301 (5103-5096)

5096 pipelines
No resources on line

SL 5293 (5103-5096)

5101 road
5098.2 road
5097.4 road
5097 road
No resources on line

SL 5285 (5103-5096)

5096 Arch site
5097.4 road
5098.5 pipeline
5100 road

SL 5277 (5103-5096)

5096.5 wash
No resources on line

SL 5269 (5103-5096)

5099 KF den (3 openings) 100' S of VP
5100 PBNLL burrow at VP (missing pinflag)
5103 Arch site

SL 5261 (5103-5096)

No resources on line

SL 5253 (5103-5096)
5100.5 road and pipeline
No resources on line

SL 5245 (5103-5096)
5102 Arch site
5100 road, and buried pipeline
No resources on line

SL 5327 (5095-5088)
No resources on line

SL 5319 (5095-5088)
No resources on line

SL 5311 (5095-5088)
No resources on line

SL 5303 (5095-5088)
5089.5 wash, too rough for trucks
No resources on line

SL 5295 (5095-5088)
No resources on line

SL 5287 (5095-5088)
5093.6 pipeline
5091.5 wash
No resources on line

SL 5279 (5095-5088)
5092 road
5093 wash
5094 road
No resources on line

SL 5271 (5095-5088)
5094.5 road
5094 pipeline, use road to avoid
5093-5092 pipelines. drive around OK
5090 fence, drive around OK. Road on drive around
5089 Arch site
5088 Arch site.
No resources on line

SL 5263 (5095-5088)
No resources on line

SL 5255 (5095-5088)
No resources on line

SL 5247 (5095-5088)
5090 KF den, 3 openings. 20' S of VP
5092 pipeline
5092.5 pipeline

SL 5329 (5087-5080)
No resources on line

SL 5321 (5087-5080)
No resources on line

SL 5313 (5087-5080)
5086.5 pipelines
No resources on line

SL 5305 (5087-5080)
5087 wash
No resources on line

SL 5297 (5087-5080)
No resources on line

SL 5289 (5087-5080)
5087-5086 roads
5085 road
No resources on line

SL 5281 (5087-5080)
5082 road
5083 PKF den (inactive)
5084.6 two track
5086 road
No resources on line

SL 5273 (5087-5080)
5087 Arch site. Drive around travel OK
5084.6 Hwy 33
5084-5082 Arch site. Use flagged drive through
5080.5 road, and buried pipeline

SL 5265 (5087-5080)
5080-5082 road
5082.5 Hwy 33
5086 road and pipeline
No resources on line

SL 5257 (5087-5080)
5083.25 pipeline
5083 PAGS 10' N of VP

SL 5249 (5087-5080)
5079.5 pipeline

SL 5323 (5079-5072)
No resources on line

SL 5315 (5079-5072)
No resources on line

SL 5307 (5079-5072)
5075.25 pipeline
No resources on line

SL 5299 (5079-5072)
No resources on line

SL 5291 (5079-5072)
5078 paved road
No resources on line

SL 5283 (5079-5072)
5072 road
5073 Arch site. Use road to avoid
5073.5 road
5075.9 old KF den (collpased) Drive by OK

SL 5275 (5079-5072)
5079 road
5077.6 pipeline, old two track
5076.75 road
5074 two track
5073.2 road
5072 pipeline, and two track

SL 5267 (5079-5072)
Oil field compressor station, many roads and pipelines
5072 roads
5079 road
No resources on line

SL 5259 (5079-5072)
5079 pipeline
5072.5 pipeline, and road
5072 PBNLL burrows

SL 5251 (5079-5072)
No resources on line

SL 5317 (5071-5064)
Oil field roads, and many pipelines
No resources on line

SL 5309 (5071-5064)

Oil field roads and many pipelines.
No resources on line

SL 5301 (5071-5064)

Oil field roads and many pipelines.
No resources on line

SL 5293 (5071-5064)

5064.75 pipelines
5064 PBNLL burrows at VP
5066 Cryptogamic soils on line

SL 5285 (5071-5064)

5071 road
5069 well pad
5068 road, and pipeline
5067 pipeline
5064 well pad
No resources on line

SL 5277 (5071-5064)

5064 two track
5064.5 road
5065 well pad
5066 well pad
5069 two track
No resources on line

SL 5269 (5071-5064)

5066 PBNLL burrows 100' N of VP

SL 5261 (5071-5064)

5071 PBNLL burrows 50' S of VP

SL 5253 (5071-5064)

No resources on line

APPENDIX C

SOURCE AND GEOPHONE (RECEIVER) LINE MONITORING NOTES

Results of compliance monitoring are presented in this appendix for source and geophone lines. Information is presented by source ("rack") or geophone line and station number. A summary of sites designated for long term monitoring of impacts recorded during seismic activities is presented in Table 1. A summary of sites for which restoration/reclamation was conducted is presented in Table 2. Vibe pad depression data are presented within the daily monitoring notes (first page of Appendix C).

Acronyms Used During the Chevron - Santa Fe Midway 3D Seismic Project

PKFD = Potential kit fox den
KKFD = Known kit fox den
KKFPD = Known kit fox pupping den
PAGSB = Potential antelope ground squirrel burrow
Badger Den = Badger Den
PBNLLB = Potential blunt-nosed leopard lizard burrow
GKRB = Giant kangaroo rat burrow
PGKRB = potential giant kangaroo rat burrow
BOB = Burrowing owl burrow
Erho = *Eriastrum hooveri* (Hoover's woolly-star)
BOL and EOL = Beginning and End of Line
Crypto = Cryptogamic soils
CL = Center Line
RSE or EOR = Road side edge or Edge of Road
ft = feet
PL = Pipeline
ca = approximately (circa)

Appendix C. Table 1. Summary of Sites Designated for Long-term Monitoring of Impacts Recorded During Seismic Activity.

Rack 5225. ***Small Mammal Monitoring Site *** Marked as #1, on PVC rebar stake

Rack 5159. ***Small Mammal Monitoring Site*** Many potential PAGS, BNLL and old or inactive GKR burrows. Lots of other k-rat also. Avoided all GKR intact precincts, but impossible to avoid all other burrows. Moving anywhere just impacts others. For the most part k-rat scat seen (smaller species). Estimated that 23 burrows destroyed by vibes, even taking least impact route. These are potential BNLL and AGS burrows.

Rack 5273. Still moving between swath 5208-5215. *****Small Mammal Monitoring Site***** Many small mammal burrows. No avoidance possible. Moving just impacts others. Between vps 208-215, estimate that 27 small mammal burrows which are potential BNLL and AGS burrows were destroyed.

Rack 5283. Many small mammal burrows which are potential BNLL and AGS burrows. Good habitat. Could not avoid since moving anywhere else just impacts others. *****Small Mammal Monitoring Site***** Estimate 29 burrows destroyed by vibes going directly over. At vp 07 is an old Elk Hills historic pupping den (5B-17). Surveyors moved vp to road to avoid impact to den.

Rack 5267. Very active short-nose area with some burrows obviously good for BNLL and PAGS. Nice flat habitat in B.V. Valley. The vps involved include 207-205. No real avoidance possible since moving just impacts others. *****Small Mammal Monitoring Site***** Estimate vibes destroyed 56 burrows. Vp 204 moved 35 feet west for BOB and old known kit fox den Elk Hills 5B-10. Vp 203 avoided PKF/BOB. Vp 200 moved 50 feet east for GKR.

Rack 5243. Moving down GPL to get to rack. There are many GKR but they cover the whole area and actually as I have scouted around, the GPL is the best route because it is on the edge of a wash where there are less precincts and I can get vibes through. However we are not doing too badly for meeting the criteria for distance or at least feeling fairly safe in the few places where we don't. ****Small Mammal Monitoring Site****

Rack 5231/29. (with offsets). In sump areas (9B sumps). Difficult getting through terrain. Finding last minute routes and avoided all resources. AGS burrows listed at vp 5195. These were avoided. Burrows at 5191 in too soft sandy area. Most of these were occluded. Missed the viable ones by driving around. Cryptogamic soils mentioned in source notes is widespread - no possible avoidance for all of it.

Rack 5223. Washy area in wastewater pond areas but lots of burrows which could be PBNLL or PAGS. *****Small Mammal Monitoring Site***** Estimate that 10 burrows were destroyed by vibes driving through necessary route.

Rack 5239. Stack and drive-around for kit fox den at 184. ***** Small Mammal Monitoring Site***** Lots of burrows unavoidable. Estimate 21 burrows taken between vps 181-183 especially.

Rack 5241. Avoided GKR at vp 180. ***Small Mammal Monitoring Site*** Estimate about 12 burrows taken. Unavoidable take of PAGS/PBNLL because moving impacts others and there are no roads to move vps to.

Rack 5211. Stacked at 168 to avoid GKR. Stacked on high and low sides to avoid old badger burrow at vp 74.5. Still had to drive by (but not shake) fairly close to burrow. ***Small Mammal Monitoring Site*** Lots of PBNLL/AGS burrows in area of crypto crust. Avoided as well as possible, but estimate takes at 23 burrows.

Rack 5235. Flagging at Kit fox den and GKR removed. Very old and collapsed. Lots of small mammal burrows scattered along route and no real avoidance possible. Moving just impacts others. ***Small Mammal Monitoring Site*** Estimate that 19 burrows taken which are PAGS or PBNLL

Rack 5259. Skirted old GKR precinct at 175. Pretty decimated but worth avoiding. Lots of small mammal burrows. ***Small Mammal Monitoring Site*** Other species colonized old GKR burrows, even these appeared inactive. Potential for BNLL and AGS. Estimate that 27 burrows were unavoidably taken when vibes went over route. Still part of old DOE study area.

Rack 5269. Lots of crypto and small mammal burrows. Unavoidable takes for PBNLL and PAGS. Moving just impacts others. ***Small Mammal Monitoring Site*** Estimate that 30 burrows between vps 165-167 were destroyed by driving over.

Rack 5261. BNLL avoided at vp 162. Other burrows no possible avoidance. Moving just impacts others. ***Small Mammal Monitoring Site*** Estimate that 5 burrows were destroyed by vibes driving route.

Rack 5253. Drive-arounds cleared for washes. ***Small Mammal Monitoring Site*** Estimate 16 PBNLL/PAGS burrows destroyed driving on route.

Rack 5237. Avoiding crypto and burrows as possible. However moving impacts other burrows. ***Small Mammal Monitoring Site*** Estimate take of 27 PAGS/PBNLL burrows.

Rack 5229. Finding route ahead of vibes avoiding crypto and burrows as possible. No complete avoidance possible. ***Small Mammal Monitoring Site*** Estimate a take of 21 PBNLL/PAGS burrows.

Appendix C. Table 2. Summary of Sites Within the Midway 3D Prospect for which Reclamation/Restoration was Conducted.

March 14, 1997

6:00 am. meeting.
Started vibing about 7:15 am.
Still vibing swath 1168-1176.

Rack 5275. No resources on rack but we are in the 8B R.V. bowl area and there are lots of resources in the area (mainly kit fox dens and AGS).
Rack 5283. No resources.
Rack 5291. 7B hilltop and ridge. No resources immediately on route but dens below im banks.
Rack 5299. No resources.
Rack 5307. Difficult terrain. Cleared several drive-arounds and avoided resources.
Rack 5315. Difficult terrain. Cleared several drive-arounds and avoided resources.
Rack 5323. Avoided PKF while clearing drive-arounds for different route.
Rack 5331. Den mentioned as active in source notes is definitely not, but is a viable known kit fox den (Elk Hills). Stacked and drove around.
Rack 5339. OK.

*** all of the above racks were in the 7B/8B hills and ridges. Soils were extremely unstable and there were few roads. Many old trails existed, but these were extremely soft as well. Vibes were getting stuck numerous times and many alternate routes had to be found. This was all very time consuming. The recorder was notified that the whole area would have to be checked for rehab and restoration, especially since the juggies would go back through again impacting it further.

Rack 5153. Still scouting ahead. Mostly developed oilfield and roads. At 5153 20 vibe trucks did an excellent job going up a fairly steep hill. This was one of the few vps in habitat but I felt they could try because the hill was not too gravely for traction. Bart driving, and he is an excellent driver. Going down the backside of the hill to the west, the front vibe went too far down and bogged on the hill at vp 21. Pulled out by another vibe. Cleared a turnaround. Notified recorder we needed rehab done here. They came out right away to fix it up.

January 18, 1997

Note that it has not rained since the night of Jan 15.

Started vibing at 6 am. First line 5131 (72-80 swath). Deep ruts and pad depressions showing up but rack continued to see if soil conditions would improve since soils are so variable. Advised recording that if conditions continue like this we would have to stop. Also requested rehab. for the habitat on this rack.

Rack 5147. Going very well at the start (high side) of the rack north of wash. The wash crossing was rutted when it was crossed but mainly because it had artificial berms which were several ft high. It is an old disturbed asphalted wash at the intersection of the road. After wash crossing vibes started to dig ruts so I advised Western to shut down which

they did. This was approximately 9 am. Reiterated that these three racks today had areas that needed rehab attention.

Rack 5163. Tracks and vibe pad depressions running borderline in some places and good (within 75% of normal) in others. Scattered ruts along line. Informed recorder of need for rehab. PKFD at vp 79 not possible to access how recommended in source notes as this would mean vibes perpendicular to Midway Rd. and completely blocking the road and we can't shake on county roads either. No way we can do this. Vp approached from the west and stacked 50 feet from den (vibes basically parallel with Midway Rd. just north of the shoulder).

9:40 am. Finished 5172 rack and vibes heading to town on next swath (80-89) close to airport. Called recorder to reiterate what racks need rehab - 31 and 39 from yesterday and 47, 55 and 63 from today (on 72-80 swath).

Rigs stuck in wash on 5127 Rack (near 5127/5094). Needs rehab. Called in to recorder. Rehab 5125 Rack, too. Good habitat and washes.

5141/5109 Offset. No resource found. Can roll NE to 2 track and drive out to gravel road. Rehab 5133/5103 (called in).

5149/5096 and 5149/5098 Rehab areas. Called in.

5157/5096 Pulled flagging on dead end holes. Access on SL OK.

5157/5099 Wash damaged by vehicles. "Turn and back" area had to be cleared. Rehab wash and slopes.

5165/5093 Rehab. Called in.

Rehab 5165/5099 Rehab. SL and wash. Called in

Rehab 5165/5109 Rehab. slope and wash. Called in.

Rehab 5171/5108 Wash and slopes. Called in.

Rehab 5171/5111. Rehab. Called in.

Rehab 5163/5109 Rehab. wash and nearby areas.

Rack 5273. With offsets. (5018-5023). HWS at vps 21 and 22 . Had difficult time with vibes because to avoid was dangerous sidehill. HWS also on old trail which peaks at hilltop with powerline structure. We drove on a few HWS plants but this trail was obviously driven on before either by the power company or the rancher. At 5273 5020 was sidehill. Vibes tried to travel the fenceline. Got one vibe stuck. The lead vibe tried to pull him out and he got stuck too. Left 4 deep ruts. Site was in shaded drainage area and slightly boggy. Asked scouts to repair which they did while I was there.

Rack 5151. (5024-5031). Still in mostly developed oilfield area. Few pieces of very poor disturbed habitat we went ahead and vibed. If good habitat as we stair-step up easy to move slightly to nearby roads or pads. At vp 5030 vibe bogged and got stuck. Small ruts dug but not bad. Notified recorder to fix and juggies came out to fill them

Rack 5125. (with offsets). (5008-5015). Vibes stuck at 25 12. Raining again. Made a few ruts and were fixed immediately. Pulled resource flagging at 23 15 (gophers).

Rack 5115. (with offsets). (5008-5015). Ruts just off road at vp 5013. Called recorder to fix. Scouts working on them now. Vps 14 and 15 look good.

Rack 5113. Still wet in some areas. Some tire and pad depressions 4 inches. Rack is in rolling low hills and has just enough slope to cause vibes trouble (slipping). Called recorder to come out and fix the scattered deep ruts left in these areas. Scouts are working on them in the meantime. Also informed recorder that we should skip the 21 rack because it has similar habitat (rolling hills and wet areas). They said fine and that they would go wherever I thought they could vibe (i.e., in the sandier soils with less wet vegetation).

Rack 50 91. A few ruts left on this rack and one truck had trouble traversing a drainage along wash edge. Recorder notified to fix ruts. Scouts working on them in the meantime until juggies arrive. No resources.

January 17, 1997

Misc. note: J. Jennings along and noted difficulty of assessing these borderline tracks/pads when some are very good and some are very bad and there is variability between the racks themselves. If it stayed all bad we would certainly have quit right away. With wet weather behind us and a series of upcoming storms lined up ahead of us it seems reasonable to give the conditions a good test before quitting knowing our vibe time is limited. So far Western has quickly repaired the lines that have ruts and there has been no condition resulting in a requirement for reseeding. Since agency-specified reseeding is an approved mitigation measure mentioned in the biological opinion, it is reasonable to assume that such an event (damage requiring reseeding) can occur.

January 18, 1997

Started vibing at 6 am. First line 5131 (72-80 swath). Deep ruts and pad depressions showing up but rack continued to see if soil conditions would improve since soils are so variable. Advised recording that if conditions continue like this we would have to stop. Also requested rehab. for the habitat on this rack.

January 19, 1997

Started vibing 5:40 am. resuming on 5147 south of wash crossing near road intersection. This is the disturbed "asphalt" wash. Line not going much better than yesterday - we're going over the vibe path to access. Informed recording that this rack needs repair, especially between points 72-74 (deep ruts). Still dark when vibes moved onto 55 rack. Very difficult to monitor vibes in the dark. Also very foggy this morning contributing to the wet condition of the soils and lack of visibility. Uphill on high side of rack (78 & 79), one vibe slid off line and partly down the wash embankment. Left deep rut. Cleared drive-around along pipeline to avoid the terrain. Just getting light enough to see to clear drive-around. Called recorder to request line be fixed as soon as possible.

Rack 5067. Vps 80-87 (with offsets). This rack newly surveyed in (about one hour before vibes arrived there. Location is just off of Lincoln near the sheriff's station. Most of line in town or on the dirt road. Few points on high side in habitat area vps 86-87 close to Lincoln. Half of vibe path has good pad depressions and tire tracks, other half (lowside) deep (these were in kind of a soft, loamy area). Rusty there and his opinion was we wouldn't be able to shake. I told him we would try the 73 rack at least because there we were in sandy gravely soils which might hold up and the area was kind of disturbed by ORV trails, dumping, and an old habitation site by a large tree. Will have scout fix up the rut in the boggy area.

Rack 5073. Vibe line looks good (well within 75% range) with only one 30 ft rut. Vibe scout filled this in.

Rack 5081. Vp 87 stacked 30 feet from AGS burrow in small wash. Took great care to do this as it was a nice burrow. Just after we finished two kids on motorcycles drove right over the burrow in the small wash. Ruts on ORV road edge (from travel back down road from vibe line). Vibe was trying to catch up and dropped a wheel off road edge. Scouts filling in rut. Otherwise within 50% of normal. We are also avoiding receiver line travel wherever possible to reduce impacts.

Rack 5135. Source notes say move at vp 95 but don't list resource. Potential AGS/BNLL is actually at vp 93. Stacked to avoid and then driven around. Rut made at vps 88-90. Western notified to fix. Scouts working on it in the meantime. Portion of this line had some soft/boggy areas.

Finished up on rack **5061** near town. Vibratech there. These vps and offsets have been in generally disturbed areas like pipelines, roadsides, fencelines and ORV trails, however the first vps on the high side of the line were wet and the trucks dug ruts. Recorder notified to send a crew out to fix the high side of the rack. Finished last vp at 7:10 pm. Conversation with recorder regarding possibility of vibing before light. Not a problem as far as habitat but we are immediately adjacent to houses and usually don't vibe before 7am which is what Rusty has insisted on in the past.

SL 5083 to have ruts restored. Called in. This rack has deep ruts but is in previously disturbed area. Recontouring of ruts being done by jug crew by hand. Met with crew chief to demonstrate how to restore the habitat, especially the deep ruts or cuts. He understood and did an area while I watched.

Rack 5171. Moving between next swath 1168-1176. No resources. Rain and hail coming down. Need to fix ruts at vp 73, south of rd. Called recorder and advised them to do so.

Rack 5281. Vp 176 shook on road to avoid Elk Hills den 8B-7. Also stacked on low side. Vp 177 OK. Vp 178 has ruts on side of hill, right off 8B ridge road at curve. Told scouts and recorder these need to be repaired. Ground very soft. Ruts are in several sets 6-10 inches deep, about 20 feet long.

Midway 3D Source Monitoring Notes

November 26, 1997

Meeting 6:00 am. Some points of meeting. This will be a short day from starting late. Vibe testing was done yesterday. Today we will vibe first racks.

Points of meeting; no drive-around flagging, Arch and Bio flagging colors will be the same. No typed drive notes to work with. Meeting every morning for key personnel will start at 5:30 am.

Pattern of vibing will be from EOL (west). Then we will stair-step up in a brick pattern moving from low to high numbers (or high to low) moving continuously between the swaths 1000 to 1032 (all the way up or down between these). This is where the geophone lines are placed closer together.

Rack 5261. This rack is back in foothills of Temblors in grazing lands. Surveyed a drive-around to get to vp 5002 due to steep hill and wash. Had to cross wash because no other way in. Burrows in wash banks undisturbed by shaking or by drive-around. Very compacted ground. Flagged a PAGS at 5002 (not previously marked). Missed easily by 35 ft.

Took vibe pad and tire depression measurements on the first rack, of the first day of vibroseis activity, as required by the permit. However, it is my recommendation that rack 5261 not be the standard for the whole project, as we are currently back in the foothills of the Temblors (and will be for many of the first racks and subsequent racks that occur in the southern part of the prospect). Soils are heavily compacted from years of repeated heavy grazing activities. We can expect soils due to the size and extent of this project to be highly variable. Monitors will have to establish a different baseline for what is acceptable in the different soil types.

Vibe Pad Depressions (Rack 5261)

0.25"	**0.2"**	**025"**	**0.65"**	**1.0"**
0.15"	**0.2"**	**0.2"**	**1.5"**	**0.15"**
0.2"	**0.3"**	**0.2"**	**0.3"**	**0.2"**
0.15"	**0.25"**	**0.15"**	**0.16"**	**0.1"**

Avg. = 0.33"

Vibe Tire Depressions (Rack 5261)

2.3"	**0.2"**	**0.3"**	**1.7"**	**1.1"**
0.2"	**0.25"**	**0.3"**	**0.1"**	**0.3"**
0.2"	**0.15"**	**0.15"**	**0.5"**	**0.25"**
0.3"	**0.2"**	**0.25"**	**0.2"**	**0.3"**

Avg. = 0.45"

Note: This rack was checked about 2.5 months later after there had been measurable rainfall across the project. The pad and tire depressions had virtually disappeared in many places which had measurable impact before.

Note: After other observations of the effects of vibe and tire track depressions in different soil types, additional data computations done in the field indicate that; (1) loamier soils, such as those found in many areas of Midway Valley (especially bottomland areas) had average pad and tire depressions closer to 1.3 inches (not in a saturated state), and that (2) firm sandy loams with good grass cover (not in a saturated state) had average pad and tire depressions near 0.7 inches, and (3) very firm gravely loams averaged about 0.3 inches in depth.

Hand notes are not typed or in order. I am not able to make heads or tails of them. Basically I am walking ahead of vibes and clearing routes and needed drive-arounds (lots of hills). As we come to resources we stack, move to avoid, and some resource flagging I remove because the resource is not viable. Often we are

not going where the resource is marked because of terrain. As mentioned above we are stair-stepping up, and not always in a logical or pre-determined pattern because of picking up offsets. See map. Vps very convoluted in places.

Rack 5263. With offsets. Again we are going from 5008 in a brick pattern up through 5032. We are using roads when possible, also clearing new routes due to terrain and avoiding resources. Some soils very hard and rocky. Will finish going up these racks (brick pattern) tomorrow.

Vibes stopped at shortly after five. Discussion with recorder as to permit. I mentioned not starting racks this late that they need to be out of the area by two hours after sunset not dark, and vibes will be finding parking yet, gassing up and then driving crews back to the Santa Fe yard. Complete agreement by scouts and recorder.

November 27, 1997

Meeting at 5:30 am. Discussion and reiteration of permit times for operating.

Rack 5263. With offsets. Finishing from yesterday. Routed vibes around a PKF and crypto soils in wash at vp 5030. This rack not found in hand notes. Basically I am walking ahead of vibes monitoring as I go. Resource flagging (looks like PAGS) avoided by staying on roads.

Rack 5279. Rack has offsets to 5080. (5026-5231). Ran over small burrow. *Perognathus* most likely (very small). Not counted as take (too small). Also not destroyed all the way. Couldn't reroute because vibes would be sidehill. At fenceline avoided PAGS/BNLL burrows by going through the middle. No other route (side hill). Burrows fine but didn't meet avoidance criteria. South of fenceline cleared vibes a turnaround (near vp 5031).

Rack 5271. (5024-5031). Known kit fox den 50 ft. south of vp 5029. Nice den. Offset vp 50 ft. NW to get 100 ft. buffer. Survey notes have badger den at vp 5027 - it is actually at 5028.7. Found one more PKF. These dens were all on a large mound feature. Avoided by driving around.

Rack 5273. With offsets. (5018-5023). HWS at vps 21 and 22 . Had difficult time with vibes because to avoid was dangerous sidehill. HWS also on old trail which peaks at hilltop with powerline structure. We drove on a few HWS plants but this trail was obviously driven on before either by the power company or the rancher. At 5273 5020 was sidehill. Vibes tried to travel the fenceline. Got one vibe stuck. The lead vibe tried to pull him out and he got stuck too. Left 4 deep ruts. Site was in shaded drainage area and slightly boggy. Asked scouts to repair which they did while I was there.

Because of getting stuck, the drive train of one vibe and the rear end of the other were damaged. Checked with recorder. There will be no more vibing today. Vibes stopped at about 12:30 pm. We will not vibe again until Monday when parts are in and vibes can be fixed.

*** Thanksgiving Break ***

December 2, 1997

5:30 meeting. We will start at 5275/5020 where vibes broke down. I mentioned permit restriction and also that the Western crew was in agreement with me when I called the times at night. Steve Tabor present and reiterated points in the permit. Also discussed six-packing which I told the lead driver was OK but the recorder said no. Steve assured them it was OK when necessary.

Vibes starting late at 5275/5020. Also many offsets due to hills. Route did not impact any resources. Many line problems today. Finished this rack at 11:15 am.

Rack 5257. (5016-5024). Still no notes. Lots of flagging on this rack. I am avoiding resources as I go. Many new routes for terrain. Rerouted and also stacked for PAGS at 5019 & 5022.

Rack 5255. (5024-5031). OK on roads.

Rack 5259. (5008-5015). Hilly. Last 2 vps 008 and 009 set to roads. Stacking for terrain on this rack; can't maneuver hills.

Rack 5253. (5000-5008). Vp 07 up in drainage by itself. Still continuing stair-step pattern (brick) and will

continue this while traveling between swaths 1000-1032.

Rack 5251. Lots of offsets to 5049. (5008-5015). Vp 5049 5010 on road. Resources avoided on drive-arounds for terrain. Will finish this rack tomorrow.

December 3, 1997

Rack 5251. With offsets. (5008-5015). Dead rabbit at Vp 5251 5014. Carcass right on line. Scout wanted me to record this so it was verified Western did not run over it. Carcass is old.

Rack 5247 (5024-5032). Vp 5026 is dump with pipes. Very disturbed with recent dumping and oilfield trucks coming and going picking up pipe from some of the more organized racks. Kept vibes 20 feet from pipes. I looked through all the pipes. Most not configuration and size that foxes would use. Saw no sign of activity. Monitored while they shook - no problems. Kind of a tight area to restrict vibes even more.

Rack 5239. (5024-5031). Flat area in oilfields at high side of rack, then heads south into hilly areas.

Rack 5241. (5016-5023). Moved 5241 5023 35 ft. north to get clearance around PKF and PAGS in bank and area below bank (multiple entrance).

December 4, 1997

5:30 am. meeting. Main discussion was about Bio surveyors physically moving flags. Western surveyors also feel giving list of offsets getting to laborious. Today's list has Jim doing a full days work. My suggestion was only to report very extensive moves such as for puppy dens and let the vibe monitor deal with the rest since much flagging is removed for occluded burrows, or vibes can stack for many resources.

Rack 5237. With offsets. (5000-5007). OK

Rack 5231. With offsets. (5024-5031). Vp 5229 5026. Kept vibes mostly on roads but still shook within buffers for PKF and PAGS. Several marked burrows were collapsed when probed, so didn't worry about avoidance. Vp 5231 5030 pulled resource flagging at *S. beecheyi* hole. Too large for AGS, too small for kit fox. Not habitat for BNLL.

Rack 5223. (5024-5031). Vp 5024 shook without trying for more avoidance. PAGS burrow beneath ATPO bush next to road. Did not want to move out into habitat. Also moving up or down the road would just impact other burrows.

Rack 5225. (5016-5023). GKR colony at vp 18. Moved Vibes over onto trail to east about 50 feet and partially stacked. Interesting colony way back in hills with very powdery soils and moonscape look. Definitely an active colony with several active precincts.

Note: Returned on January 10 to check on this colony. A truck ran close to the flagging. I don't believe it was project related but rather related to the lease and tanks to the east. Can clearly see vibe path to the east on the trail where I rerouted them. No harm done. ***** Set up as a Small Mammal Monitoring Site. Marked as #1 with location 5225 18 on PVC rebar stake *****

December 5, 1997

Meeting 5:30 am. Some permit discussion. Western is behind schedule and project is "slipping". Continuing to run source racks in brick pattern between GPLs 1000 and 1032.

Rack 5223. (5024-5031). Had barely started this rack last night. Vibed mostly on roads. No resources to worry about.

Rack 5229. (5000-5011). (with offsets). Missing some flagged PKFs due to terrain drive-arounds. Vp 5006.2 removed Bio flagging. This was probably marked for a PKF but was an occupied *S. beecheyi* burrow. Also pulled flagging in the edge of the bank. Saw a *S. beecheyi* go into this hole earlier when I was scouting rest of line. Vibes will not drive directly over it anyway, because it is too steep of a cliff. At vp 5002 an AGS was sighted foraging above ground in a small wash which was a surprise back here in these hills where *S. beecheyi* is so prevalent. However, it was a discrete small wash with what looked liked good habitat (lots of burrows) for AGS. He went into a burrow which I flagged. Vp was moved 45 ft. to the other side of the drainage so as not to interfere with his foraging activities or impact the burrow by shaking too

close. We are still dealing with a lot of steep terrain in the foothills. I still don't have source notes and the handwritten notes are difficult to follow. Still monitoring ahead of the vibes finding routes and avoiding necessary resources.

Rack 5221. OK Avoided resources while finding drive-around routes when necessary.

Rack 5219. (5008-5015). PKF at 5014 in roadside. Shook on road with no restriction (regularly traveled road). Stacked vp 08 for terrain on sidehill.

Rack 5207. (5024-5031). Started rack at 4:50 pm. Generally flat area. Advised Western vibes need to observe the permit time due to habitat.

*** Dead coyote reported over radio at GPL 1056 station 1111 ***

Rack 5209. (with offsets). (5016-5023). Lots of flagging for PAGS at points 19 and 20. These are on fingers of land with steep sides. No where to move vibes. Vibed within buffer zone about 5 feet away from PAGS. One burrow flagging removed because it appeared occluded. Kit fox natal den (beautiful multiple entrance den with lots of scats and prey remains) on a slope facing north. Noted as I was working on a drive-around in a different area. Without typed source notes I did not see it until vibes started downhill. Den was positively not active, but because it was located between two vps (5021 and 5022), den was subjected to vibroseis at approximately a 90 ft. distance two times. I monitored the den closely while vibing. Den stayed intact and no sign of occupancy. The upper road is an oilfield road to a hilltop which does have traffic on it on a regular basis, disturbing the den range.

Rack 5205. (5000-5007). No resources. Some drive-arounds cleared.

Rack 5199. (5024-5031). Vps on oilfield roads.

Rack 5191. (5024-5031). OK Vps on roads and trails.

December 7, 1997

Rack 5191/93. (with offsets). (5016-5023). Vps on roads.

Rack 5197. (5000-5007). Good AGS country from 5000-5003. Route runs through wash for a distance. PAGS burrows in banks of wash at vps 5000-5004 and up above a sighting of an AGS in road bank. Wash disturbed by cattle and pipes at northern end. Southern end more pristine. Drove some grassy area in wash because vps 01 and 02 can't be skidded. Avoided rest in banks by moving to get 30 ft. clearance and then stacking.

*** kit fox sighting reported to me on GPL line 24 station 1187, heading west (time about 8:45 am.) ***

Rack 5187. (with offsets). (5000-5015). Marked AGS burrow at 5005 does not probe back. Flagging removed. Vibes mainly on roads.

December 8, 1997

Rack 5179. (5008-5015). Vibes mostly on roads and trails. A few disturbed areas were cleared to shake.

Rack 5173. (5000 5007). Vibes on oilfield roads and trails.

Rack 5159/5163. (with offsets). (5016 5023). Moved vp to east out in habitat near nuked area at site of new Santa Fe well construction. No resources.

No time to write all notes down for today. Lots of scouting ahead. New drive-arounds cleared. Resources avoided as necessary.

December 9, 1997

Rack 5164/5015. Start of rack, then heading south. Offsets on this rack. Rack mostly on oilfield roads to 5000. Very little habitat and few resources. Avoided where routes altered.

Rack 5157. (with offsets) (5000-5007). Rack starts east of gas plant at 5000. Stays on roads and pipelines. I still don't have complete set of source notes so am scouting and monitoring in front of vibes. No notes for this rack but generally not a problem. In developed areas for the most part.

*** Light rain beginning to fall about 9 am.*** I let Western know there is no problem as far as habitat concerns vibing on oilfield roads in the rain. Repairs to roads or damage to them is an issue to the lessee or landowner and this would be between Western and that party. Started to rain harder. I kept Western going by scouting ahead to see what points were located on roads which we could shake and checked for habitat areas we might have to skip. Scouted ahead on Rack 5157. Vps 00-07 OK, on roads.

Rack 5155. (with minor offsets). Vps 08 and 09 on road; vp 10 on edge of well pad; vp 11 in very dense brush with a concealed pipeline. Vp should be moved to road to avoid pipeline; vp 12 on road to well pad; vp 13 in turnout to wellpad; vp 14 in road; vp 15 edge of paved road.

Rack 5153. Still scouting ahead. Mostly developed oilfield and roads. At 5153 20 vibe trucks did an excellent job going up a fairly steep hill. This was one of the few vps in habitat but I felt they could try because the hill was not too gravely for traction. Bart driving, and he is an excellent driver. Going down the backside of the hill to the west, the front vibe went too far down and bogged on the hill at vp 21. Pulled out by another vibe. Cleared a turnaround. Notified recorder we needed rehab done here. They came out right away to fix it up.

Rack 5151. (5024-5031). Still in mostly developed oilfield area.
Few pieces of very poor disturbed habitat we went ahead and vibed. If good habitat as we stair-step up easy to move slightly to nearby roads or pads. At vp 5030 vibe bogged and got stuck. Small ruts dug but not bad. Notified recorder to fix and juggies came out to fill them.

Rack 5143. (with minor offsets). (5024-5031). Still don't have source notes. Scouting ahead and clearing. Still in developed oilfield following brick pattern up and down. Vps are mostly on roads, edges of wellpads, turnouts etc., only occasionally crossing a corner of degraded habitat.

Rack 5145 (5016-5023). Have no source notes. Scouting and monitoring ahead of vibes. These vps in developed areas.

December 10, 1997

Ground is surface dry. We will be vibing today.

Rack 5147 (5008-5015). Still in developed oilfields. Offset 5147 5011 for PKF and PAGS marked.

Rack 5149 (with offsets). No notes. Still in developed areas. Occasionally find Bio flagging but we are mostly staying to roads and pads and not going through habitat (basically no access through the discrete habitat areas anyway).

Rack 5141. (5000-5007). Tracks look good. Seems fairly dry at about 8:30 am. However I am scouting the lines again to see where we can vibe and check for habitat. Vps mostly in developed areas.

Rack 5139 (with offsets). (5008-5015). Moved 5139 15.

*** Observation of kit fox relayed to me. It appeared to be limping and was seen at Line 1024 between stations 1082-1084. Observer reported lots of Bio flagging in area. A blue Ford pickup with an extended cab also seen nearby.***

*** Light rain beginning to fall about 10:30 am. ***

Rack 5127. (5024-5031). In developed areas on roads and wellpads.

*** About 4 pm. vibes are becoming very restricted because of rain that has been falling. We are beginning to skip points that don't look possible (like steeper roads, wet wellpads and bogs). I am scouting with Western and we are skipping all over. No time to write notes - trying to keep Western moving. Vibes quit about 4:30 pm.

December 11, 1997

Overcast and sprinkling lightly. Soils in some areas draining. Today will be the same as yesterday. I will be working with the scouts driving all over to see what we can shake. These points will be out of order and impossible for me to keep consistent notes. Anything noteworthy about a resource will be written down though.

Rack 5132 (with offsets). (5008-5015) Starting at 5132/5011 and moving south down through 5133 rack. OK - no resources.
Rack 5133. Vp 5004 had to drive through habitat. Avoided PAGS at 02 and 04 by stack and drive-around. Looks good. Dry soil a few inches down. Tracks and vibe pads about 30% deeper than normal.
Rack 5123. Scouted vps mostly on roads and pads. Bio flagging at 5018 and 5015. Avoidedresource at 23 18 because we aren't going there.
Rack 5125. (with offsets) (5000-5007). No resources.
Rack 5125. (with offsets). (5008-5015). Vibes stuck at 25 12. Raining again. Made a few ruts and were fixed immediately. Pulled resource flagging at 23 15 (gophers).

From this point on vibes will only stay on roads and we will jump around considerably due to rainy wet conditions.

December 12, 1997

Spent most of the day jumping around to get vps which we could access (due to wet areas) and returning to get vps scattered on several racks that we could not get yesterday. Basically it was on a one by one basis. Lead vibe would call out what point he was going to or going back to get and I would scout it out. I also worked with the scout ahead of time as much as possible anticipating where we would be going next. The scout would check out feasibility of access to the vps. This was considerably time consuming, as many that were returned to were still too wet to shake.

Started out at 5117 5007. Went back to 5023 5019. Did not get due to wet habitat. Failed getting 23 13, 14, and 15; 21 16; 22 17; 21 18.

Rack 5100. Started at 5000 going north. Had to skip 5004 and 5005 in wash. It was nothing but disturbed habitat but steep to get down to it and very mucky in the bottom. (It was like a pit). Very slow day.

December 13, 1997

Rack 5100. Returned to 5005. Offset this vp to road. Too wet in wash.
Rack 5091. (with offsets). (5000-5008). Vps on roads.
Rack 5115. (with offsets). (5008-5015). Ruts just off road at vp 5013. Called recorder to fix. Scouts working on them now. Vps 14 and 15 look good.
Rack 5104. (with offsets). Vps on roads and trails.

December 14, 1997

Still jumping around today. There were still wet areas. Slowed production again.

Rack 5097. (5016-5023) Vp 19 had to be reshot again.
Rack 5095. (with offsets). Vps 5023-5027 landowner would not let us shake on his road, vibes had to move out in the habitat immediately adjacent to the road. This was not Western's choice. Ground a little spongy at vps 24 and 25. Vibe tracks at about 65% deeper than normal. BNLL/AGS burrows between 30 and 31 avoided by stacking (we had already moved for landowner).
Rack 5089. (5016-5023). Six-packed vibes to avoid BNLL at vp 5018).
Rack 5098 Waited for three days for this line to dry out. Vps 12, 13 and 14 were shook. Erosion was the major concern. The wash below was very active with burrows and damage at the vps would have impacted them.

December 15, 1997

Rack 5073. (5016-5023). Pulled Bio flagging at AGS burrow at 5018. Burrow does not go back.
Rack 5066. (with offsets). (5008-5015). No resources. Vp 66 09 moved to road.

December 16, 1997

Starting at 5061 5011. This vp offset by itself. It is near ARCO Midway Sunset Well #80 in the hills adjacent to Taft.

Rack 5049. (with offsets). (5016-5023). Vps on roads and trails.

December 17, 1997

Rack 5045 (with offsets). (5028-5031). OK no resources.
Rack 5041 (with offsets) (5015-5023). These vps are basically a convoluted mess. Refer to map. Very difficult finding, but generally not much for resources. We are just adjacent to Taft and taking them one by one. This area is a heavily used ORV area. Lots of flags missing etc. Avoided badger den at 5021 by stacking and then driving around.
Rack 5041. (with offsets). (5024-5031). Working with scouts to find all of these points. Lots of offsets because of proximity to town. Not finding source notes for past three days that give me data and numbers for most of the points. Basically I am again monitoring as I go where the scouts ask me to and we deal with the resources (very few) as they come up. This is not a high resource area and is heavily disturbed.

December 18, 1997

Rack 5015. (with offsets). 5024-5031. Avoided PAGS and badger den by offsetting and stacking and following existing drive-around flagging.
Rack 5007. Vps 30 and 31. No resources.
Rack 5005. (5032-50390. No resources.
Rack 5013. (5032-5039). No resources.
Rack 5021. (5032-5039). No resources. Cleared drive-arounds for terrain.

December 19, 1997

Rack 5045. Vp 25 in ORV area adjacent to Taft. Vp 47 in Taft streets.
Rack 5029. (with offsets). Vps 5028-5035. OK No resources.

*** Numerous scattered points adjacent to Taft and town streets ***

Rack 5061. (with offsets) (5032-5039). No resources.
Rack 5069. (5032-5039). Kit fox sighted at dump west of rack near powerlines. No resources on rack.
Rack 5077. (5032-5039). At vp 32 a kit fox den is in bank of wash. This is a known den. Stacked on high and low side to avoid.
Rack 5085. (5032-5039). Removed flagging at badger den marked at 5032-5032.5 - occluded. At vp 33-34 moved 30 ft. NW to avoid PBNLL burrow.
Rack 5093. (5032-5039). No resources.
Rack 5101. (5032-5039). No resources. Vibes mainly on roads.
Rack 5109. (5032-5039). Stacked for BNLL at vp 5035.

December 20, 1997

Rack 5117. (5032-5039). Vibed on road. No resources.
Rack 5125. Vibed on oilfield roads.
Rack 5133. Vibes using existing oilfield roads and wellpads etc.
Rack 5141. (5032-5039). No resources.
Rack 5149. (5032-5039). On roads and well pads. No resources.
Rack 5157. Pulled flagging at 5157 5034 because den narrows down too far and we will be vibing on road.
Rack 5165. (5032-5039). No resources.

*** We have hit the "zipper" and are moving up to the next swath to work between GPLs 1040-1048.

December 21, 1997

Rack 5171. (5040-5047). Vp 45 moved to trail to avoid PKF.
Rack 5163. (5040-5047). OK No resources.
Rack 5155. No resources.
Rack 5147. No resources.
Rack 5139. No resources.
Rack 5131. No resources. Still in developed oilfields between swath (GPLs) 1040-1048.
Rack 5123. (5040-5047). At vp 42 pulled flagging because burrows occluded and are too small for AGS. At vp 46 routed vibes around bank with AGS holes. Still shook on road but vibes did not get to close to bank and no visible impact.

December 22, 1997

*** Light rain falling ***

Rack 5115. No resources. Vibes got stuck at vp 47 trying to back out of a dead end and area was slightly wet. Called recorder to fix numerous ruts and skids (but none too deep).
Rack 5107. Vibed in habitat. Would have had to offset all points as landowner does not want vibes on road.
Rack 5099. (5040-5047). Shook in habitat. Landowner does not want us shaking on his road. No resources.
Rack 5091. (5040-5047). No resources.
Rack 5085. (5040-5047). No resources.
Rack 5075. (5040-5047). Pipe den (known) at vp 46. Huge latrine right by it. Looks like a cable truck drove over it, no damage was done.

December 23, 1997

*** Having a short day due to Christmas Break beginning today. Will be getting some odd points around Taft outskirts until then: Vps done: vp 5019 40; vp 5018 41; vps 5017 42-46; vp 5014 47. No resources found. Basically I am working with the scouts and going with them since the points are so scattered and I am not sure of their pattern. I don't have the daily list.

Rack 5011. (5040-5047). Avoided badger dens and PAGS from vp 42-45.5 by stacking and veering slightly off line.
Rack 5003. (5040-5047). Stacked and drove around for PAGS at vp 41.

*** Christmas Break until January 3rd ***

January 3, 1997

Return from Christmas break. Habitat wet from several days of rain. Still raining during am. meeting. Habitat totally saturated and standing puddles. No way to vibe today in habitat even if it stops raining and Western is not set up (does not have line laid out) to vibe in town.

January 4, 1997

Western planning to vibe in town. I scouted out racks in the habitat to cover that option (on the 48-56 swath). The 45 and 53 rack looked good because they were flat. 45 was in the Santa Fe lease and 53 was on mostly gravely road sides and sump roads. Also checked out 61, 69 and 97 racks and gave Western the information. Mentioned to them that some other racks were too wet to try.

Vibes starting up at 5080 49. Removed flagging at vp 81 52 because it looked like a pocket gopher hole not an AGS as stated in source notes. Few skid marks and deep pad/tire depressions. Some vegetation picked up by tires. Rack okay but this rack is flat. Told Western that racks with hills are out until it is drier - we'll tear them up too much.

Vibes going to Taft City streets at this point in afternoon.

January 5, 1997

Raining. Met at Taft office at 5:30 am. It has been raining since 1 am. and even if it stops soon there is no chance we could vibe (not looking like it will let up anytime soon).

January 6, 1997

Clear and sunny today. Crew coming in at 7:30. Still too wet to be in habitat but will be trying the 5097 rack (working on the 48-56 swath moving west) rack scouted on 1/4 because it is mostly on a dirt road. What vps aren't on the road initially, Western plans to offset to the road. Western is concerned about all the lost time due to weather and Scott wants to extend the permit hours beyond the two-hour window when he needs to catch up on production. I explained that would mean an amendment and agency permission and that I would need to run it by Steve Tabor first.

Rack 5075 vps 48-51. Tried to vibe a corner of habitat within a developed area near town (we had been in town prior to this) to see how habitat holds up. This was only one vp. Couple of vibe pad depressions were 5 inches and vegetation stripped up from tires. Told recorder we would have to stay out of habitat for a few more hours of drying.
Rack 5097. Mostly on road. One or two points in habitat were moved to the road and shook.
Rack 5105. Surveyors moved this rack completely to road so that we could continue shaking. Pipe den just north of vp 55. However, there is a bunny in it and the vp has been moved to the road anyway.

Recorder says we are quitting on this end because of the wet habitat and will be moving line to vibe town vps. Vp 07 55 off I-119 stacked on dirt road to avoid area of potential HWS. Vibes shut down at 5:50 pm.

January 7, 1997

Start line 5001 (swath 48-56). These vps were moved to the top of the ridge because they were on a steep slope and the habitat was still too wet. Vps 53 and 54 were in a drainage and were moved to the road. 01 48 was torn up and the recorder was notified to send a crew to repair damage to habitat.

Rack 5065. Off I-33 & Hilliard St. Offsets at 67. Dumping, heavy ORV use here. No resources.
Rack 5073. (with offsets). No resources.

Vp 5080 48. This vp skipped yesterday because it was wet. There was quite a bit of jumping around yesterday getting points in and around disturbed areas in order to avoid the habitat.

Rack 5113. Still wet in some areas. Some tire and pad depressions 4 inches. Rack is in rolling low hills and has just enough slope to cause vibes trouble (slipping). Called recorder to come out and fix the scattered deep ruts left in these areas. Scouts are working on them in the meantime. Also informed recorder that we should skip the 21 rack because it has similar habitat (rolling hills and wet areas). They said fine and that they would go wherever I thought they could vibe (i.e., in the sandier soils with less wet vegetation).
Rack 5129/30. No resources on rack. Arch and Bio flagging on the roadside was avoided.
Rack 5137. No resources.
Rack 5145. This rack was scouted prior to dark so that we could vibe it after dark if necessary. No resources. No problems vibing after dark. Vibes done a little after 6 pm.

January 8, 1997

Rack 5153. Vp 49 moved 30 feet to west to avoid PAGS and wash habitat. Vp 48 stacked for wash. Marginal type PKF in wash but was avoided anyway due to stack for wash.

Misc. note: Irate landowner appeared and confronted me for Western vibing where he did not give permission. He said Western vibed too close to his well and on his road, messing it up. I told him I was the biological monitor and that I was not aware of the land ownership but that I would look at where he was

talking about and let Western know. I called Western and relayed the information. Rusty later identified him as a Mr. Bracken.

Back to Rack 5121 which we skipped yesterday. Vibing now at 9 am in drier conditions than yesterday, however there are still a few wet areas. We will proceed since Western has been skipping these areas for 2 days and they will not be able to move wire to continue to vibe until this rack and the remaining racks on the swath are done. The wet areas are intermittent and it is much drier since the rain on January 5.

Rack 5169. (including offsets). Known natal den identified in source notes at vp 53 looks like a multiple entrance known den. I do not believe it as a puppy den. No puppy scats found. Cottontail seen going into one of the entrances. This point was offset by the surveyors before we got there (for the deep wash) and stacked at the new location as well. Also vps 52 and 54 were stacked. We have moved up a swath to vibe between 1056 and 1064. Rack 5169 is the west end of the "zipper".

Rack 5175. OK, no resources.

We stopped vibing at dark because the next rack had last minute moves. Western realized they were on Bracken's land and that they would have to offset the points out into the habitat. At first I tried to survey for these points since the move was just to the roadside. However, I "fell" into a den in the dark and with several vps to survey I told Western it was not possible to continue. I explained that legally surveys for endangered species can't be conducted after dark. This was rack 48 with offsets.

Rack 5148 (with offsets). Vps were set out in the habitat. Stack at 60 for PKF. Bracken came along upset again because Western vibed on the road south of Midway Rd, not realizing the road south of the hwy. was still on his property.

Racks 5143, 5135, 5127, 5119 and 5111 okay on line - no resources or problems.

Rack 5103. Source notes mention GKR and avoidance flagging along this line, but don't specify which vp. However, no GKR was found and no avoidance flagging seen.

Rack 5095 (with offsets). No source notes for this rack. Vps 62 and 63 in yard. AGS burrow at intersection of source rack and receiver line so stack was done east and north of vp 56 to avoid by 30 feet.

Coyote sighting reported at line 1080 station 1009. Numerous hawks reported at GPL 1072, station 1141 (circling). Lone red-tail reported at 1080 station 1110.
Racks 71, 79 and 87 okay no resources.

January 10, 1997

Racks 5061 and 5055. (with offsets). Most vps in disturbed areas or in town. No resources found.
Vibes in town the rest of the day. I did other monitoring including scouting out upcoming racks back in the habitat. We did not know if Western would make it back to the habitat by late this afternoon or by dark.

January 11, 1997

Vibes getting a late start today. J. Jennings along for awhile to observe.

Rack 5007. (with offsets at 05). Some vps in disturbed area. 07 56 was shook on road to avoid area of HWS and stacked for the highway. Vp 57 across I-119 on the berm. Still in HWS area. Vp 58 east side of railroad berm. 05 59 located near natal den (not active). Vibes were stacked at vp 58 nd vp 59 to avoid den by 150 feet. A multiple-entrance den was located to the south in the railrod berm. This was a known den which from the stack was also avoided by 100 feet. S. Tabor later told me that a natal den is in the berm somewhere in the area. The multiple-entrance kit fox den was the only one we saw within the buffer area. I could not find puppy scats on it. It also was not active and most of the entrances were fairly occluded.

Rack 4999. OK no resources.

Scouted 05 rack on next swath (64-72) but we are going back to the west end (high side) of the swath to start.

5175 rack (with offsets). Kit fox dens at vps 64 and 69 were avoided because vibes avoided wash by alternate route and stacking for terrain.
Rack 65. Avoided PKF at vp 65 by stacking 50 feet from resource.
Rack 57. Kit fox pipe den (PKF atypical) found west of vp 64. This was not mentioned in source notes. Not active so the 50 foot distance was adequate.
Rack 49. Vp 69 moved 40 feet west to avoid PKF.
Rack 41. Flagging marking an old burrow was removed. Burrow type not identified in notes.
Rack 5133. Stack and drive-around for AGS/BNLL at 65 and 68.
Rack 5125 (swath 64-72). OK no resources.

January 12, 1997

Drizzling today. May get too wet if it keeps up.

Rack 5117. Stacked at road for burrows at vp 65. Stack and drive-around for pipe den and PKF near vp 66.
Rack 5109. Stacked for AGS burrow at vp 66.5. Recorder is parked nearby. With all the parking at the recorder day after day its amazing that no one has run over this lone little burrow.
Rack 5101. OK no resources.
Rack 5093. Short drive-around cleared for terrain. Stack at vps 69 and 70 for PKF in between.
Rack 5085. No source notes. Stack at vp 69 for pipeline and den in wash.
Racks 5077 and 5069 OK no resources. Drizzling still. These racks are near town in habitat disturbed by ORV trails, dumping etc. Tracks are okay except for a few isolated ruts. Not too serious also considering the disturbed quality of the habitat.

Vibes went into town after these racks. This was about 3:30 pm.

January 13, 1997

Vibes still in town at 11 am picking up points not finished on last swath including 05 rack near the prison.

First rack outside of town at BOL on next swath (72-80) is 5003 (with offsets). Obvious kit fox atypical (pipe) pupping den at vp 04 73 which was not mentioned in source notes. Actual source point is on road adjacent to sump (20 feet from pipe). Pipe is lying beside the sump fence. Foxes (2) are in pipe. Pipe is thick with prey remains inside and at entrance. Obvious puppy scats. Called surveyors to move point because it is a large move and not obvious to me or vibe scout where it can be placed and a stack is not possible. Vp moved all the way across the wash (about 200 feet). Vibes back to town and will be in town the rest of the day (now late afternoon).

January 14, 1997

At 9 am. there is snow on ground (scattered areas across project) but clouds breaking up to become mostly sunny and warm after a surprise light snow flurry. Vibes are in the town of Taft on streets. They will be in there several more hours, then I will check habitat to see if vibing is feasible in the habitat. Approximately 1 pm. ground drying enough to try to vibe the 67 and 75 rack (72-80) swath. These racks are on the outskirts of Taft and in disturbed areas for the most part.

Rack 67. This goes through the Chevron fenced enclosure behind the sheriff's office. It is wet but it is some kind of scraped, disced waste or storage yard. Nasty. Very little habitat on this rack which is marginal at best. No resources.
Rack 75. No source notes for this rack. Kit fox puppy skull (old) found on line in brushy area near vp 73. Looked around for dens but none found. This rack goes through a lot of disturbed area, gravel roads and turnouts, dumping, ORV areas etc.
Rack 83. Vibed about 3 pm. after drying most of day. A few deep pad depressions 3-4 inches deep and a few scrapes and ruts, but most of rack looks good (25-75% of normal). Soils generally are hard and sandy in this area. No resources.
Rack 91. A few ruts left on this rack and one truck had trouble traversing a drainage along wash edge. Recorder notified to fix ruts. Scouts working on them in the meantime until juggies arrive. No resources.

January 15, 1997

Steady, constant rain. No chance of vibing today.

January 16, 1996

Rained last night compounding already wet conditions due to the rain yesterday, Jan 15. Surface soils are saturated. Western wanting to vibe. When I mentioned it would not be dry enough to even try to vibe within the permit guidelines for several hours yet, Western decided to call the whole day a weather day. They cited that it was too costly to mess around for half a day.

January 17, 1997

No rain since the night of Jan 15. Surface is drying, however it has stayed overcast. Not sure if the cloud cover is stratus or high fog? Not conducive to drying out habitat at any rate.

Started vibing at 6:30 am. Jim Jennings along for the day.

Rack 5099 (72-80 swath). Borderline for tracks and pad depressions. Some okay at 2-3 cm deep but some 4-5 inch pad depressions and tracks. Intermittent muddy spots. Advised recorder that we may have to stop if the trend continues. No resources on line.

Rack 5107. Looks better than 5099 as far as tracks and pads. Hoping things will get better. Because many parts of line look good vibes are continuing. No resources.

Rack 5115. Rack started out good then ruts. Advised recorder that if trend continues we will shut down.

Rack 5123. Line started out well (on low side) but then more intermittent ruts and deep pad depressions. Much of line running 2-3 times normal depth for these soils under dry conditions. Vibes shut down at 10 am. following my recommendation. GKR burrow mentioned in notes at 5073.5 definitely not GKR and also seems kind of occluded after the rain but was avoided anyway.

Misc. note: J. Jennings along and noted difficulty of assessing these borderline tracks/pads when some are very good and some are very bad and there is variability between the racks themselves. If it stayed all bad we would certainly have quit right away. With wet weather behind us and a series of upcoming storms lined up ahead of us it seems reasonable to give the conditions a good test before quitting knowing our vibe time is limited. So far Western has quickly repaired the lines that have ruts and there has been no condition resulting in a requirement for reseeding. Since agency-specified reseeding is an approved mitigation measure mentioned in the biological opinion, it is reasonable to assume that such an event (damage requiring reseeding) can occur.

January 18, 1997

Note that it has not rained since the night of Jan 15.

Started vibing at 6 am. First line 5131 (72-80 swath). Deep ruts and pad depressions showing up but rack continued to see if soil conditions would improve since soils are so variable. Advised recording that if conditions continue like this we would have to stop. Also requested rehab. for the habitat on this rack.

Rack 5139. Borderline with some very good parts (25-50% of normal) but a few very bad spots (75-200% of normal). Advised recording of conditions. Invited Rusty and Scott to come out to see what conditions look like so they understand when and why we would shut down. They came out shortly and looked over the lines and seemed to agree to what was too deep.

Rack 5147. Going very well at the start (high side) of the rack north of wash. The wash crossing was rutted when it was crossed but mainly because it had artificial berms which were several ft high. It is an old disturbed asphalted wash at the intersection of the road. After wash crossing vibes started to dig ruts so I advised Western to shut down which they did. This was approximately 9 am. Reiterated that these three racks today had areas that needed rehab attention.

*** Crews out next day working on repairing the damage from the last few days. Filling the ruts looks excellent, especially after laying the sod back down ***

January 19, 1997

Started vibing 5:40 am. resuming on 5147 south of wash crossing near road intersection. This is the disturbed "asphalt" wash. Line not going much better than yesterday - we're going over the vibe path to access. Informed recording that this rack needs repair, especially between points 72-74 (deep ruts).

Still dark when vibes moved onto 55 rack. Very difficult to monitor vibes in the dark. Also very foggy this morning contributing to the wet condition of the soils and lack of visibility. Uphill on high side of rack (78 & 79), one vibe slid off line and partly down the wash embankment. Left deep rut. Cleared drive-around along pipeline to avoid the terrain. Just getting light enough to see to clear drive-around. Called recorder to request line be fixed as soon as possible.

Rack 5163. Tracks and vibe pad depressions running borderline in some places and good (within 75% of normal) in others. Scattered ruts along line. Informed recorder of need for rehab. PKFD at vp 79 not possible to access how recommended in source notes as this would mean vibes perpendicular to Midway Rd. and completely blocking the road and we can't shake on county roads either. No way we can do this. Vp approached from the west and stacked 50 feet from den (vibes basically parallel with Midway Rd. just north of the shoulder).

Rack 72 (with offsets). Vp's 70 72, 69 73 and 67 74 look good as far as tracks. Rest of rack north of Midway Rd. 72 75 has PKFD marked. This is in Midway tanks area on bare, disturbed ground. It appears to be a small drainage fissure more like a *S. beechyi* burrow and small for kit fox. Removed flagging and shook on line not moving 48 feet recommended in notes. Tracks look good on rest of line - no rehab needed.

9:40 am. Finished 5172 rack and vibes heading to town on next swath (80-89) close to airport. Called recorder to reiterate what racks need rehab - 31 and 39 from yesterday and 47, 55 and 63 from today (on 72-80 swath).

Started vibing 4999-5003 rack (offsets) swath 80-87 at 10:15. No resources in notes or when surveyed ahead of vibes.

Rack 5009. (partial rack vps 84-87). At vp 84 ground squirrel hole not AGS. At vp 86 marked PKFD narrows too far down for kit fox and looks like another *S. beecheyi* burrow. Has *S. beecheyi* scat on it. Flagging removed and shook on line.

Rack 5014. Vps 80-83 OK on line (no resources). This line not in source notes but was quickly surveyed as it is located in the easement alongside airport road.

Rack 5017. OK on line.

Rack 5025. Removed flagging at vp 81.5 for AGS in source notes. This was an *S. beecheyi* den. For kit fox puppy den at vp 84: vp 83 was stacked at pinflag - to roll on point would impact den, then drive-around was taken 150' west. Vp 84 was moved (offset to 26 rack 150' west on drive-around, then drive-around flagging followed 150' west to vp 85. Vp 85 was centerstacked sideways to line so 150' clearance from den was obtained. Nice natal den. This is in the 18D DOE fenced area. Too bad a heavily used motorcycle trail goes through the den.

Finished vibing the 5025 rack at 3:30 pm and vibes headed west into Taft area.

January 20, 1997

Some rain last night. Phoned J. Jennings before leaving Isabella since it was pouring at the lake and if conditions were the same in Taft I wouldn't come down because we wouldn't be able to vibe in habitat. He described the precipitation as being a light sprinkle only at the time (6:30 am.).

Vibes in town until 9 am. Weather clearing, becoming warm & breezy.

Rack 5067. Vps 80-87 (with offsets). This rack newly surveyed in (about one hour before vibes arrived there. Location is just off of Lincoln near the sheriff's station. Most of line in town or on the dirt road. Few points on high side in habitat area vps 86-87 close to Lincoln. Half of vibe path has good pad depressions and tire tracks, other half (lowside) deep (these were in kind of a soft, loamy area). Rusty there and his opinion was we wouldn't be able to shake. I told him we would try the 73 rack at least because there we were in sandy gravely soils which might hold up and the area was kind of disturbed by ORV trails, dumping, and an old habitation site by a large tree. Will have scout fix up the rut in the boggy area.

Rack 5073. Vibe line looks good (well within 75% range) with only one 30 ft rut. Vibe scout filled this in. Very hard ground near vp 80 near old habitation and receiver line. Called recorder to let them know we would continue to 81 rack (they seemed surprised and had figured after the rainfall they would not get to vibe). I explained we would evaluate each line as we went. Some racks I am anticipating will be firm sandy loams which may hold up under vibing pressure.

Rack 5081. Vp 87 stacked 30 feet from AGS burrow in small wash. Took great care to do this as it was a nice burrow. Just after we finished two kids on motorcycles drove right over the burrow in the small wash. Ruts on ORV road edge (from travel back down road from vibe line). Vibe was trying to catch up and dropped a wheel off road edge. Scouts filling in rut. Otherwise within 50% of normal. We are also avoiding receiver line travel wherever possible to reduce impacts.

Misc. note. - For several swaths now the soils have been more sandy and gravely near Taft on the eastern portion of the swath (but west of Taft), becoming more like clay loams on the western portion of the swath to the zipper (75 location). Overall soils highly variable across the project much more so than Belridge.

Rack 5089. No resources. Still in sandy gravely soils. Tracks and pads look good. Mostly sunny and breezy so far and soils drying well in this area.

Rack 5097. No resources. Sandy soils still present. Tracks/pad depressions good.

Rack 5105. GKR mentioned in source notes at 86.5, however, no burrow or flagging seen and this definitely is not habitat - very brushy and overgrown.

Rack 5113. No GKR at 5080.5 as mentioned in source notes. Brushy, poor habitat for GKR. Have not seen others in the area. Stack at PKFD at vp 85. This rack difficult for vibes with drainages and all. Several small drive-arounds cleared. Not very good habitat.

Rack 5121. Cleared along pipeline on west side for vibes as they can't cross large pipe. Line went down around 6:10 pm. Parked vibes on wellpad down pipeline.

Had earlier scouted 29 and 37 racks for potential for early am. vibing in the dark. Too rough and too wet. Rack 29 is old test rack and it has standing water on it. 37 rack is rough (Chevron reclaimed wastewater area) and could necessitate a drive-around if vibes get stuck. This not possible in the dark. Told Western we would start up at daylight. They were very agreeable.

January 21, 1997

At morning meeting discussed conditions that would have to be right to vibe in the dark. Also mentioned if they need a place to park vibes in the habitat they need to ask me to clear that before dark. I was asked to do that too late last night and this necessitated a longer drive to a well pad. Also mentioned that a previously disturbed area is preferable to parking in habitat when possible.

Vibes sent to town to vibe a missed point on Cedar St. Vibing resumed in habitat on rack 21 at 8:10 or so.

Rack 5129. Old test line. Rack followed as it was previously vibed for test. Good thing as there is flagging all over and it is not clear what is marked in some places. Source notes don't describe resources (test line survey). They only say line was surveyed and vibed. Standing water from yesterday is gone.

Rack 5137. Chevron wastewater area - reclaimed. Very disturbed with no resources.

Racks 5147 and 5153. OK on line. Tracks/pads still looking good.

Rack 5161. Crossed Midway Rd. Drive-around for steep wash at low-side. Ruts at 87. Change in soils here. Getting to edge of Midway valley bottomlands . Soils are wetter and not as sandy/well-drained.

Rack 5169. Vps 80 and 81 ok as far as tracks and pad depressions but soils are definitely wetter here. Rest

of rack intermittent ruts and deep pads. Same bottomland soils.

Rack 5175 (Vps 5088-5095). We have moved up a swath and are vibing between GPLs 1080-1096. Soils seem a little drier but are still wetter and very different from the sandy gravely loams on the east side toward Taft and also the soils we just left south of Midway Rd. These loamier soils seem to have more clay content and would compact more readily even when dry. Still too wet. Some places on rack okay but running 2-3 times normal compaction in many spots. Let recorder know that we scouted next rack and it appeared drier overall, but that we would discontinue vibing if we dig ruts.

Rack 5167. First vps on high side 95, 94 okay as far as ruts and compaction. Hit a boggy drainage crossing near 93 and left ruts but this would have been bad even if dry (confluence of drainages). Went a little further toward 92 but did not vibe 92. Stopped vibes (around 5:00). Called recorder to tell them we would not finish rack or move onto another one. Parked vibes on pipeline. Starting a light sprinkle as we were leaving and very overcast. Let recorder know that we would not start before daylight because weather and soil conditions would be dicey.

January 22, 1997

Rained during the night. Checked in at Western office at the usual time (5:30 am.) to verify weather conditions and coordinate with Western, and to meet G. VerSteeg (to train). Western calling it a weather day and saying crew to call in at 7 am. tomorrow. K.H. will show up in field tomorrow at daylight to observe habitat condition so Western can be apprised by start of crew call-ins.

Took G.V. to field for some orientation and training, gave maps, permits etc. to read. Left field at 12 pm. Typed notes at home.

January 23, 1997

Arrived in the field at 6:30 am. to assess habitat conditions in order to apprise Western of vibing possibility. They are having crew call in at 7 am. Checked rack 67 from Jan 21. Most of rack dry except the drainage bog. In the surrounding habitat, some areas still wet (drainages and slopes, and some lowlands). Also went up next two racks. Looks very good for vibing. Most of flat surface of habitat dry, overall, well within the permit to try vibing. Does not look like any new rain fell last night. Called Western office before 7 am. to give them a report but they never answered the radio. Returned to office and Scott stated that they would not vibe until tomorrow, a conclusion they reached on their own. He mentioned that he did not have his radio on which is why I did not reach him. Left Western office about 9:30. Typed notes at home.

January 24, 1997

Overcast today. Gay VerSteeg along for the day. Vibes starting up at 6:45 at 67 91 (Rack 5167 vp 91). This is along the 88 to 95 swath. Vibe path looks good as far as tracks - only a few wet spots but vibes didn't really compact soils significantly in these few areas.

Rack 5159. Stack at vp 95 for AGS. Minor drive-around for pipeline cleared.

Rack 5151. 90 offset and resurveyed to miss AGS/BNLL burrow. Source notes specify it as a GKR. Not likely - wrong habitat.

Rack 5143. Pulled resource flagging. Too small for AGS and BNLL even. Listed in notes as GKR, again not likely.

Rack 5135. Source notes say move at vp 95 but don't list resource. Potential AGS/BNLL is actually at vp 93. Stacked to avoid and then driven around. Rut made at vps 88-90. Western notified to fix. Scouts working on it in the meantime. Portion of this line had some soft/boggy areas.

Gay VerSteeg monitoring next two racks. K.H. had errand to NPR-1 to pick up NPR-2 soils maps. I typed her notes.

Rack 5130 vps 88 and 89. New offset. Surveyed but no resources.

Rack 5127. Vp 93 lists GKR in notes. Not GKR, flagging removed. PKF (pipe) 50 feet E. of vp. Avoided while stacking for wash (terrain).

Rack 5119. These vps were moved down a swath due to the sump. Resource flagging removed at vps 81 and 85. Burrows aren't viable. Vps 80-84 no resources.

Rack 5111. Vp 90 stacked for possible GKR. Open, flat area east of sump which is representative of GKR habitat. Burrow is single entrance and certainly of size but may be Heermans. Other marked burrows are collapsed and occluded and small drainage fissures. They may be very old decimated GKR precincts. Burrow at 5111 90 was stacked. The flagging at vp 91 for PGKR removed.

Racks 5102, 5095, and 5087 rack no resources. Vibes finished 5087 and out of habitat on edge of town at 6:45. Checked Rack 5079. It is on edge of town and in very disturbed area. Roadsides and within a fenced enclosure. Told Western they could vibe it after dark (they requested this info). However due to proximity to town they stopped at 5087.

January 25, 1997

Overcast and very light intermittent sprinkles. Vibes starting up at 5079 rack just outside of town. Fenced area - no resources on this rack.

Rack 5074. (Has numerous offsets). Vp 93 has a PKF in large disturbed berm. Stacked to avoid.

Rest of vps in town on streets or in marginal habitat areas until **Rack 50**31 where the line goes through the corner of DOE 18D fenced area. (Vps 88, 89, 90 and 29 91 on 5029 rack).

5020 03 is new offset moved to next swath. Surveyed and shook. In marginal roadside habitat.

Racks 5023 and 5015. No resources. Vibes finished at 7 pm. on 15 rack.. These were offset to the road through the sewage treatment area. The other 3 vps are in habitat. I recommended that Western not shake these after dark today, and before it is light tomorrow because of the resource considerations. Large wash which is wildlife corridor is adjacent as well as a known pupping den. Vibes may not be able to traverse the area without getting stuck and I can not survey alternate routes at night. Western very cooperative.

Dead red-tailed hawk reported on line 1088, station 1204

January 26, 1997

Vibes started up on vp 15 90 in habitat at 6:40 am. Pipe den not mentioned in source notes is 30 feet to south. However it is not a known den and I could clearly see that there wasn't a fox in it. The vp was being stacked on an O.R.V road (or old access road) anyway.

Rack 5007. Vp 07 88 is on south side of large wash. PKF avoided by moving and stacking 50 feet to east (also for wash). Most of the rest of the 07 rack offset to roads and roadsides or in the sewage treatment area within the fenced "keep out". Original source notes said too many burrows to list and biologist to lead trucks. Since the points were offset to roads and roadsides and the others were in the irrigated field and these were *S. beecheyi* ground squirrel burrows anyway, this was not necessary. Ground was boggy wet from the treatment and Western had a difficult time not sinking the vibes and missing all the irrigation pipes and sprinkler heads.

Intermittent light rain starting around 10:30 am. Sprinkles then the clouds roll on by. No real habitat consideration because vibes are mostly on roads or roadsides or in the shit (sewage plant) so far.

Rack 5001. Looks like this rack on the 88-95 swath was surveyed and written up twice in the source notes. Rack mainly in sewage area - no resources.

Rack 5006 (with offsets). Moved up to next swath. This rack is on the 96-103 swath. Most of rack in the irrigated fenced enclosure of the sewage treatment plant. Stinks! Again source notes say too many burrows to list and biologist to lead trucks. These are *S. beecheyi* burrows not AGS or BNLL and too small for PKF. There is kit fox sign (scats) in the area though, but its boggy from the irrigation and overrun with *S. beecheyi*. No place to go to avoid *S. beecheyi* burrows

which are all over the waste disposal area and no reason to, and avoid the pipes and sprinklers as well. None are PKFs.

Finished offset at 05 and lead vibe is buried in the irrigated area after trying to back out. This is at vp 96. Probably would not have gotten stuck except that it finally closed in and started to rain and since there was no habitat consideration, were trying to finish the rack. Recorder called it a day. This was about 1 pm.

January 27, 1997

Arrived at Western office at 5:30 am. Scott W. had ordered a crew call-in at 7 am. to check conditions. It was obvious that we would not be vibing today. Scot W. and Mike W. mentioned it had rained most of the night and early morning hours as well. I mentioned to Scott that we had areas that Western could shake that were in disturbed habitat (like the irrigated sewage site, roads and disturbed habitat on the edge of town) but that after we got out of town and moving to the west it was a lost cause in the habitat. Scott said he didn't want to shake for those limited number of points because it was not cost-effective.

I left the office to check the field and the weather in order to enter a description in the daily monitoring notes and assess conditions and probability for Tuesday vibing. Very wet - not a chance for vibing in the habitat. The minimum requirement under the permit would not be met - surface soils are completely saturated and there is standing water.

Kit fox sighting reported at line 1072, station 1051. Fox foraging near the school

J. Jennings called and reported that it was still overcast in the afternoon and that it had gotten even cooler, but that there had been some surface drying.

January 28, 1997

Vibes starting up in waste disposal area. Still working on swath 96-103 except for cross-line moves. Starting on road at 5012 96 (13 rack) where surveyors just moved it and offset a few others to stay out of the boggy sewage area. No habitat concerns here, it is still in the sewage disposal area.

New offsets surveyed for Bio and cleared: 16 08 (crossline move), 36 01, 35 02 34 03 (noted scattered arch flagging around but not clear if they are spot marking at times or marking off a large discrete site (arch not on map) and 43 01.

Rack 5021. 21 04 a new crossline move. Near park off road. Kit fox potential den 15' south of vp. Centerstacked high side 50' from flag. Rest Franklin field area and sewage disposal.
Rack 5029. This is in the horse arena area. Mostly roadside and disturbed. Not noteworthy except that a fox was observed inside the track in the grassy area where all the horse equipment is (the people from adjacent corrals ride here). No time to walk over toward the corrals and look for the den. The vibes are not close enough to worry about a buffer & we aren't going that way to shake.
Rack 5037. OK, some offsets which were listed above and already surveyed and cleared for Bio.

Offsets for 41, 43, 44, 45, and 47 racks. Numerous new offsets in this area. Includes the two fenced areas just west of Harrison street which are north and south of each other and some of the residential area. Basically walking ahead of the surveyors and trucks to clear for Bio. Source notes don't have complete coverage of the area and many are immediate moves ahead of the trucks. Some points have been moved several times. Some points are on or along the pipeline with the red and white sign and near some residential area. Some of these points were shook yesterday as crossline moves. Arch flagging confusing. The arch site is marked on the map but the perimeter fencing is all flagged too. What does that mean?

Racks 5053, 5061 (with offsets). OK no resources.

Finished up on rack 5061 near town. Vibratech there. These vps and offsets have been in generally disturbed areas like pipelines, roadsides, fencelines and ORV trails, however the first vps on the high side of the line were wet and the trucks dug ruts. Recorder notified to send a crew out to fix the high side of the

rack. Finished last vp at 7:10 pm. Conversation with recorder regarding possibility of vibing before light. Not a problem as far as habitat but we are immediately adjacent to houses and usually don't vibe before 7am which is what Rusty has insisted on in the past.

January 29, 1997

Gay VerSteeg monitoring vibes today.
5:30 Meeting
6:30 Drove out to north edge of Ford City.
7:00 Vibing Swath 13.
5069 Rack - very disturbed area (RV's, roads).

Weather overcast; no rain.
First vibe point 5069/5103. Lots of offsets today (offset into next swaths, north and south).
Vibe tracks in habitat made a few ruts in moist areas. Overall not bad. OK to vibe.

SL 5077 offsets (2 SP's per moved point due to pipeline).
SL 5083 to have ruts restored. Called in. This rack has deep ruts but is in previously disturbed area. Next rack appears drier.
SP 5085/5099 PAGS on line. Follow flagging to N to avoid by 30'. (Vibes followed flagging correctly.)

Recontouring of ruts being done by jug crew by hand. Met with crew chief to demonstrate how to restore the habitat, especially the deep ruts or cuts. He understood and did an area while I watched.

5093 Rack
5093/5009 Offset. No resources found. Damage repaired.
5093/5093 Offset. No resources found. Damage to habitat on 5093 looks OK; drier than earlier in day. Few areas have ruts.
5093/5102.5 PKF flagged in island in wash. Rigs will vibe 9302, back out, and drive around to 9303, avoiding PKF and wash.

5101 Rack
5101/5103 No resources found.
5101/5102 Habitat needs restoration by hand.
5101/5093 Offset. No resources found. Vibes went back up this line at request of recorder.

5109 Rack
5108/5109 Offset. No resources found.
5017/5109 Offset. No resources found.
5109/5093 Offset. No resources found.

Recontour GPL 1096 route traveled. Near 5111/5094.
5112/5093 Offset. No resources found.

5115/5096. No resources found.
5116/5097. No resources found.
5116/5098. PAGS S of SP. Flagged W to avoid.
5117/5102. No resources found.
5117/5103. No resources found.

5125 Rack
5125/5100. PGKR. SP moved 50' N. to avoid resource. Drive into SP and back out.
5125/5099. PAGS on line and PKF 30' N. Moved SP 100' S. Drive S from 5100 to this SP to avoid resource and other obstacles in area. Monitored rigs closely and all went well.

5125/5098. PAGS. Flagged drive around to N to avoid PAGS by 30'.

5133 Rack
5133/5097.5. PAGS. Flagged drive around to S to avoid by 30'.
5133/5097. PKF 60' SW. Follow flagging exactly from road to NW to avoid by 50'.
5133/5093. No resources found. Cleared access to road to S.
5133/5100.5 Pulled flag on PBNLL. Holes went nowhere.

Rigs stuck in wash on 5127 Rack (near 5127/5094). Needs rehab. Called in to recorder. Rehab 5125 Rack, too. Good habitat and washes.

Tomorrow at meeting bring up staying on the tracks and roads by rehab people. No turn arounds on access lanes. Prefer that they walk in.
Rigs parking in a previously cleared parking area by dirt road.

5133/5096. Last vibe point 6:15PM.
In office at 7PM.

January 30, 1997

Gay VerSteeg monitoring vibes today.
5:30 meeting. John brought up my issue of the need for the jugs to walk in or drive carefully on vibe tracks when doing repairs.
7:00 called recorder and said all was ready for vibing on first vibe point 5133/5097 (swath 13).
7:30 Began vibing.
Weather: Overcast and clearing. Soils are not saturated. Minor ruts.

5133/5109 Offset. No resource found. In old reveg. area.
5141/5109 Offset. No resource found. Can roll NE to 2 track and drive out to gravel road.
Rehab 5133/5103 (called in).
5141/5193 Offset. No resources found. On disturbed shoulder.

5149 Rack
5149/5102 Weird flagging in short straight lines about 150' apart. Arch flagging? Tracks in area. Non-seismic? Stack and back out.
5149/5109 Offset PAGS 30' W. Flagged to avoid. In reveg area.

NOTE re: 5149 Offsets
These offsets take as much time to locate, walk and clear as an entire rack. There are two offsets for each lost SP. It is going to be impossible to be with the rigs properly, clear these new offsets and prevent damage to the habitat. Recorder notified of possible delays. Other biologist came to clear 4 offsets. Took 3 hours to clear the offsets.

Rehab areas at 5149/5096 and 5149/5098. Called in.

5157 Rack
5157/5109 Offset No resource found.
51585102 to 5157/5103 No resource found.
5157/5093 Offset No resources found. Access from 51575096.
5157/5096 Pulled flagging on dead end holes. Access on SL OK.
Rehab **5157/5099** Wash damaged by vehicles. "Turn and back" area had to be cleared. Rehab wash and slopes.
5165/5093 No resources found.
5165/5106 No resources found.
5165/5097 KKFD 15' N. Moved SP 5097 and 5098 150' N.
5165/5097 and 51655098 moved 150 N to avoid KKFPD.

5165/5096 Flagged KKFPD 150' NW of SP. Not in notes.
Rehab **5165/5093** Called in.
Rehab 5165/5099 SL and wash. Called in.
5165/5109 Offset. PBNLL 25' from SP and PAGS 45' from SP. Moved SP 5' S to avoid resource. (JJ cleared offset)
Rehab 5165/5109 slope and wash. Called in.
5173/5109 No resources found. Next to road. Vibed in road.
5173/5102 PKFD. Moved 40' S.
51735097.5 PAGS. Drive around. Stacked rigs at SP to avoid.

Swath 14
5171/5104 No resources found.
5171/5107.5 PKF. Follow flagging to S to avoid by 50'.
5171/5108 PAGS. Moved SP 30' SE to avoid (looks like entrance is part of old KFD (not anymore).
Rehab 5171/5108 Wash and slopes. Called in.
Rehab 5171/5111. Called in.
Rehab 5163/5109 Wash and nearby areas.

Last SP vibed 5163/5104. 6 PM
Start of day is at 5:30AM tomorrow. 6:30 earliest start time to vibe with monitor present. 5155 Rack tomorrow.
Recorder stated there were no people to do rehab today.
End of day. Last vehicle in field left at 6:45.

January 31, 1997

5:30 meeting. Western complaining about lack of help from geophone monitor.
Weather overcast from fog. Vegetation wet but soils surface dry. Starting vibes up at Rack 5155 (swath 1104-1112, low side. No resources, including at new offset for pipeline.

Rack 5147. Stacked 50 feet on low and high side for PKFD and driven around at 47 108. Centerstack and offset 40 ft. for PKFD at 105.
Rack 5139. Notes say resource at 5104 but it is at 5109. Old GKR - now looks like Heermann's. Not active ut intact. Stacked at pinflag for 30 foot avoidance.
Rack 5131. Drive-around for wash after first vp on high side. Flagging removed at vp 110 . Vp 5109 says GKR in notes but it is a large drain hole. Wrong habitat for GKR. We are in dense, overgrown bushes and in hills. Burrow also occludes.
Rack 5123 (still swath 1104-1111). Avoided GKR at 5107 by stack and drive-around. Having difficulty interpreting source notes.
Rack 5117 with offsets at 5115. Stack for BNLL at 5107.5.
Rack 5107. No resources.
Rack 5099. Drive around for pipeline south of rack and east side of pipeline. Also had to avoid Arch site.
Rack 5091. No resources. Drive-around for wash cleared.
Rack 5083 and 5067 no resources.

Quit 7:10 pm.

February 1, 1997

Gay VerSteeg monitoring for the day for Kristie.

February 2, 1997

Jim Jennings monitoring today.

February 3, 1997

Nothing noteworthy at 5:30 meeting.
Working on Swath 1112-1120.

Rack 5081 5112. This is off Lincoln (Chevron 1C) oilfield area. No resources. Vibes broke small pipe on last vp high end. In very disturbed area. Fixed immediately and small area scraped clean. Area was already bare.
Rack 5089 and 5097 no resources.
Rack 5105. Drive-around cleared off well pad due to suspended pipeline. Note that there is a leak and spill at pumping unit (Well No. 16 NE 1/4 Sec. 2) on General American Oil Co. of Texas lease. This is not related to Western's vibroseis activities.
Rack 5113. Vp 5113 5114 GKR mentioned in notes. Not GKR. Flagging removed.
Rack 5121. No resources.
Rack 5129 with offsets. Vp 28 12 discrete on peninsula- OK. Vp 29 13 stacked on high side to avoid PKFD. Vp's 29 18&19 stacked and gone around to avoid GKR and PAGS burrows.
Rack 5137. No resources. Drive-arounds cleared for washes.
Rack 5145. GKR listed at vps in source notes are all occluded. Very old desiccated precincts in a flat area. Avoided running directly over but did not use avoidance criteria.
Rack 5153. Pulled all resource flagging - all holes were occluded.
Rack 5161. OK - no resources.

February 4, 1997

Jim Jennings filling in for me until about 9:15 am.

Line apparently was down for some time and they are just now shaking Rack 5169. We are still working between 1112 and 1120 swath. Rack 5169 cleared and monitored by J. Jennings. See his notes for incorporation.

Rack 5175 on new swath between 1120 and 1128. Rack 5175 already checked by J. Jennings.
Rack 5167. Stack at 5120 for whole hillside of Heermann's, PAGS, and PBNLL burrows. Flagging left marking burrows in roadside so vibes don't hit banks, but no other avoidance possible. Burrows are all up and down banks so moving for one just impacts another. Some resource flagging pulled because burrows were occluded.
Rack 5159 vps 5120-5127. Ruts near vps 26 and 27 off wellpad. Wasn't done by vibes but not sure if project-related or not. Pulled Bio flagging at 26 - occluded. Resources avoided or flagging removed. Not much time to write notes because busy looking and clearing drive-arounds for pipelines. Impossible route between vps 24 and 26. Dropped. Surveyors will crossline move later they tell me.
Rack 5151. Stacked on high side at vp 20 for GKR. Stacked on low side at vp 23 for AGS/BNLL
Rack 5143. Pulled flagging - burrows not viable. Cleared a drive-around.
Rack 5135. Cleared drive-around for pipelines. Pulled resource flagging. Burrows not viable.
Rack 5127. Pulled resource flagging vps 117 and 119. Burrows not viable and route changed so didn't impact other resources.
Rack 5119. Scoped out vps 20 and 21 with scouts (problem area). Started rack but line went down. Vibes called it a day at 7:20 pm. Parked vibes on wellpad by rack.

February 5, 1997

Overcast today. Vibes starting up on 5119 rack from yesterday. Started vibing at 6:50 am. Resource flagging removed at vp 22. Vibes not going there - road bank. Vibes are shaking on road.

Rack 5111. PKFD at vp 27 OK - flagging is off 50 feet. AGS at 5121 OK - vibes not going there.
Rack 5104/03 (with offsets). Burrows in roadside at vp 25 avoided.
Rack 5095/96 (with offsets). PAGS at vp 27 driven on by oilfield traffic. The burrow is in the middle of the road. I felt this was too small and AGS aren't usually in the middle of the road. There were several other burrows which I felt were too small or collapsed.
Rack 5086/87 (with offsets). No resources. Several stacks and drive-arounds for pipelines.

Rack 5079. Centerstacked for terrain so PAGS avoided at vp 126.5.
Rack 5071. No resources. Kit fox carcass listed in notes is at vp 26.
Rack 5063. No resources. Few drive-arounds cleared.
Rack 5055. No resources. Few drive-arounds cleared.
Rack 5047. No resources. Few drive-arounds cleared.

Quit about 6:45 pm.

February 6, 1997

Gay filling in for K.H. this morning

Rack 5015 (still on swath 1120-1128). I arrived at about 9:15 and rack was completed with no problems (developed area).
Rack 5007. Stacked for PKFD at vps 22 and 23.
Rack 4999. OK.
Rack 5005. We have moved to next swath between 1128-1136. Flagging removed at 5005 5135. Probed back - entrance narrows down too much for PKFD. *S. beecheyi* scat is present.
Rack 5013. ERHO encroaching onto oilfield road which leads to a tanksetting (regular use by oilfield vehicles). Plants were all flagged but I allowed vibes on the road because of the obvious constant use. Vibes appeared to have missed the plants since I left the flagging up. Most plants were at the roadside edge. A borrow pit (fresh) by Texaco (I presume because we are on their lease) destroyed HWS in the habitat. Vibes didn't go there.
Rack 5021. Heavy ORV use. Trails and trash. One wet spot in bottom of "bowl" area where ruts were left but due to the area not worth fixing. Pipeline drive-arounds cleared.
Rack 5029. Several pipeline drive-arounds cleared. No resources.

Vibes finished approx. 6:40 pm.

February 7, 1997

Nothing noteworthy at 5:30 meeting. Clear and sunny. Started vibing 6:50 am. on Rack 5037. No source notes. Arch site avoided at vp 32.

Rack 5045. No resources. Cleared pipeline drive-arounds.
Rack 5053. No resources. Cleared pipeline drive-arounds.
Rack 5061. Removed Bio resource flagging. PKFD at vp 5133 does not go back. Called John to see if this Arch site had been "cleared". Old foundation of brick, bottle dump etc. No flagging. He OK'd going through it because the Archs had surveyed up to that point.
Rack 5069. No resources.
Rack 5077. No resources.
Rack 5085. Avoided AGS at vp 29 as vibes not going there. Also not going from 29 directly to 30, using a discrete route to each. Other burrows avoided as vibes shook on roads and turnouts. Some burrows too occluded or were in banks of roads regularly used by oilfield traffic.
Rack 5093. Pulled resource flagging at vp 30. Vibes staying on road and not going down into wash. Vibes stayed on road for AGS burrow at vp 35.
Rack 5101. Offset vp 34 50 ft. SE for PKFD (culvert). Stack in six-pack on high side for PKFD and PAGS.
Rack 5109. Busy scouting drive-arounds and resource routes. No time for detailed notes but all resources avoided. Stopped vibing 6:55 pm.

February 8, 1997

5:30 meeting. Nothing noteworthy. Started vibing 7 am. Weather is overcast (started sprinkling about 10 am.).

Rack 5117. Centerstacked vp 32 on high side to avoid PAGS/BNLL and pipeline. Various stacks and minor offsets to avoid rest of resources along rack. Very busy. Good job by lead vibe driver.

Rack 5125. Very busy scouting and avoiding resources. Stacks and drivarounds to avoid numerous burrows. Most burrows PAGS in banks along roadsides. Vibed on road even though getting 30-50 feet avoidance isn't possible. Better than driving off road.
Rack 5133. Pipe culvert at vp 33. Vibes stayed on existing road to avoid.
Rack 5141. Avoided PAGS at vp 5133.5 due to stacking and rerouting for pipelines. Vibes moved to trail to avoid PAGS at vp34.
Rack 5149. GKR at vp 5167. Mentioned as PAGS in notes. This is in the B.V. Hills in a flat spot. Monitored vibes through to miss GKR and other burrows in the area.
Rack 5157. Resources avoided. Vp 57 35 moved to road and shook to avoid PKFD.
Rack 5165. Sheep all over the place. Vps 28 and 29 are located where vibes aren't going to go. Vp 29 is down off the edge of a well pad. Vp 30 vibes will stay on existing road. Vp 31 is down a cliff side and vibes can't go there. All of these burrows were PAGS.
Rack 5173. Stack for vp 28 (PAGS) at base of hill. Vibes can't go up hill where burrow is anyway. Vp 29 shook on road. PAGS is in bank and won't be directly impacted by vibes.
Rack 5171. (Now moving between swath 1136-1144). Rack moved to road to avoid numerous burrows. Vp 37 is off of well pad edge in a draw. Vibes can't go there so stacked above to miss PAGS burrows.
Rack 5163. Vp 5136.5 in bank. Vibes can't go there anyway so stacked at base for PKFD. PAGS burrows marked at vp 37 are completely gone - completely obliterated by sheep. Flagging removed.
Rack 5155. Surveyors out making numerous moves for terrain. New routes surveyed ahead of vibes to avoid mainly PAGS burrows. Very slow going.

Vibes quit at 6:50 pm.

February 9, 1997

Rack 5155. Finishing up this rack from yesterday. Surveyors out with us today making terrain moves. Rerouting ahead of vibes to avoid resources.
Rack 5147. More terrain reroutes. Monitoring ahead of vibes with surveyors. Lots of burrows but avoided by moving vps to roads. Also some burrows were not viable.
Rack 5139. Busy again today. Last minute moves ahead of vibes. Resources avoided by moving vps to road or offsetting.
Rack 5131. Many PAGS burrows. Stayed on existing roads to avoid. VPs 42 and 43 stacked to avoid PAGS.
Rack 5123. Numerous PAGS mentioned in notes, active GKR colony was missed. Monitored vibes through by moving and stacking vps 40 and 41 to avoid GKR. Rest of vps were PAGS. Some were avoided due to moves for terrain. One marked PAGS not viable.
Rack 5115. No source notes. OK on line. Vps on roads in oilfield area. Only a few pieces of habitat.
Rack 5107. Rack mostly relocated to roads while working with surveyors. Also worked with surveyors to avoid pipeline crossings which weren't stable.
Rack 5099. Vibed rack on existing trail although PAGS burrows are in banks. Do not want to move out into good habitat. Vp 39 marked as a PKFD but narrows back. Pipe den between vps 36 and 37 stacked for; also to avoid terrain. No fox in pipe.
Rack 5091. Chevron 1C office area (Midway road and I-119). Most vps moved to roads. Few in marginal or disturbed habitat. Vp 43 (PAGS) in sandy disturbed area appears occluded. Flagging removed.
Rack 5083. Vps moved to roads to avoid PAGS burrows.
Rack 5075. In oilfield - no resources.

Vibes shut down at 6:55 pm.

February 10, 1997

Overcast; expecting rain today. Vibes doing SIM/SYNCH testing this morning so getting a late start. Starting at Rack 5067. Rack OK -oilfield area.

Rack 5059. Pulled resource flagging marking BNLL. Burrow is in a cut bank/borrow pit off wellpad and 70 feet away. Vibes could not even get to it.

OIL SPILL VP 5091 5143

Scott Weathington contacted me in the field to conduct a biological assessment of an oil spill at source point 5091 5143 which may have occurred due to Western's vibroseis activities the day before on the site. Apparently a vibe struck a control valve mechanism. The result was deposition of oil affecting approximately 1/4 acre of relatively disturbed oilfield habitat. No endangered species were impacted. A full account of this spill can be found in a memo to Larry Saslaw from BioEnvironmental Associates (the date that Steve Tabor faxed the final memo to Larry is not in this record).

The site of the spill continued to be monitored on a regular basis to check the progression of clean-up and to look for any oil-related wildlife mortalities. The site was last checked on February 28. Clean-up was completed and the site looked very good with the exception of a small amount of residual oil on roadside saltbush. At this time I recommended to Western that no further action needed to be taken. I did not recommend reseeding the site, since it had been mostly scraped for development prior to the spill, and was moderately developed with roads, turnouts, and pipelines. I advised Western to seek further direction from Chevron if they felt it was necessary.

Racks 5051, 5043 - no resources - in developed oilfield.
Rack 5035. PAGS at vp 142 avoided by staying on road.
Racks 5027, 5019, 5011 - no resources.
Rack 5003. Drove by PKFD but stacked 50 ft. from den while shaking.
Rack 5001. (Now working on swath between 1144 and 1152). Stack for PKFD at vp 46. Stack for pipe den at vp 50.

Vibes done at 7 pm.

February 11, 1997

5:30 meeting. Vibes going at 7 am. Clear and sunny.

Rack 5009. Stack for pipe dens (PKFD's) in bank of roadside.
Rack 5017. No resources.
Rack 5025. No resources. Marked PKFD at vp 5145 does not go back.
Rack 5033. No resources.
Rack 5041. Move and stacked vp 5146 to avoid PKFD.
Rack 5049. No resources.
Rack 5057. Moved vp 5144 to avoid PKFD/badger den.
Rack 5065. Moved vp 5144 30 ft east to avoid PAGS. Moved vp 5149 20 ft. east to avoid PAGS
Rack 5074. Vp centerstacked at 49 and 6-pack stack at 50 to avoid burrow.
Rack 5081. PAGS at vps 144, 147.5 and 150. Avoided by shaking on existing road. Flagging in roadbanks. Line down, not finished. Vibes parked at 7 pm.

February 12, 1997

5:30 meeting. Weather overcast until about 1:30 pm Vibes starting up about 7 am. on 5081 rack from last night. (1144-1152 swath).

Rack 5089. Avoided PAGS by vibes staying to road at 5144.5. Other PAGS occluded - these were in wash bottom where it gets wet and naturally silts in.
Rack 5097. Vps moved to roads.
Rack 5105. Many PAGS on this rack. Avoided by stacking and driving around resources.
Rack 5113. Lots of PAGS on this rack. Very busy. Most resources avoided due to drive-arounds for terrain. VP 51 OK because PAGS burrows are in bank where vibes can't go.

Rack 5121. PAGS avoided by moving vps to road or stacking and driving around.
Rack 5129. No problem here as source notes mention. PAGS is in bank of road. Shook vp 5148 on road as opposed to going into habitat or moving where the trade-off is disturbing a different burrow.

VIBE ACCIDENT 2/12/97

One of the vibrator operators forgot to set his parking brake while stopped on a road at the top of a small hill. The vibe rolled downhill and tipped over onto its side in a drainage. It hit an adjacent power pole, splintered it, and made contact with the electrical wire causing it to arc. The location was near vp 5086 1146, SE of Well 544 Section 36B, T31S R23E. I was called to assess the damage which at the time was minimal to the habitat. A few ruts were made from pulling the vibe out, but no oil or other fluids had leaked onto the site from the vibe resting on its side. In a conversation with power company officials, they maintained they must blade a road in to reset the pole. This of course would cause a moderate impact to the site. I informed Western that I would return to make another assessment.

2/13 Update on Vibe Accident and Damage to Drainage.

I returned to assess the site after the power company had reset the pole. The pole had been replaced but pieces of splintered pole were still lying about. Workers had bladed a road to make an access route for their line truck. The access route was approximately 70 feet long and 12 feet wide. It was deeply powdered. Workers installed water bars to aid in erosion control.

The drainage runs several hundred feet downhill to the south eventually intersecting a road. There are some PAGS burrows along the drainage banks, however they appear high enough up on the bank so as not to be impacted if water flows rather unrestricted from the lack of vegetation above. However, the habitat along the drainage is relatively undisturbed. For this reason, and because some mammals may colonize the banks lower, I recommended to Western that they mulch and install erosion netting where the road was cut. No reseeding is necessary since there is an adequate seed bank from non-native grassland species, and revegetation should occur naturally.

2/21/97 Update on Vibe Accident and Final Erosion Control Measures

I returned to the site for a final assessment after Western informed me they had mulched the site. The mulching was certainly more than adequate in conjunction with the water bars. Since I am not a proponent of netting because I have seen animals become entangled and die in it, we refrained from installing it.

Rack 5137. Lots of PAGS burrows on rack. Flagged well. Vp 48 shook on road. Rest avoided by moving or stack/drive-around.
Rack 5144. Vp 44 ok - up above road in bank. Vp 47 collapsed - flagging removed. Vp 49 PAGS burrows avoided but pipe den found which wasn't in notes, 35'west of vp. Had vibes move over 10 ' to the east (close enough). Shone light in pipe and could not see a fox.
Rack 5153. Vp 50 PAGS burrows okay (high in bank) and vibes will be on road. Stack and drive-around for vps 45,46 and 47. Some of these burrows look like active Heermann's.

Quit on Rack 5153 at 6:30 pm.

February 13, 1997

5:30 meeting today but a late start in field due to safety meeting. Clear and sunny today.

Rack 5161. Still on swath 1144-1152. Vp 50 moved 15 feet east to avoid PAGS burrow. Vps 46 and 44 moved and driven around to avoid PAGS and PKFD.
Rack 5169. Lots of PAGS burrows on rack. Most vps moved to roads to avoid. Vps 49 and 50 OK because burrows in road banks.
Rack 5175. Moved up to swath 1152-1160. Lots of vps on roads. No resources on line.
Rack 5167. Drive-arounds at entrance and exit for rack - no access. Stack and drive around for PAGS and PKFD 5157-5157.5.

Rack 5159. Stack at vp 59 for PAGS close to receiver line intersection.
Rack 5151. Vps set to road except for vp 52 (moved and stacked to avoid PAGS).
Rack 5143. Vps on roads. No resources.
Rack 5135. Rack set to roads - no Bio.
Rack 5127. Numerous offsets. Racks are a mess. Racks will be split up to facilitate access. Resources avoided by moving and stacking. See map for all the offsets.

Vibes quit at 6:30 pm.

February 14, 1997

5:30 meeting. Vibes in field starting at 7 am. Finishing up numerous offsets from yesterday (working with scouts and surveyors trying to set them to roads, work with terrain etc.)

Rack 5103. Vps on roads. No resources found.
Rack 5095. Lots of resources. Called surveyors out. Moved 152, 153 and 154 to roads (GKR, old known puppy den and BOB).
Rack 5087. OK - no resources.
Rack 5079. Vibes rerouted east to avoid PAGS by 30 ft.
Rack 5071. OK - no resources.
Rack 5063. OK - no resources.
Rack 5055/58 (offsets). Rerouted for GKR. Current flagged route would have run over an active precinct not noted during original surveys. Vegetation is dense and the precincts were obscured. GKR were both east and west of line.
Rack 5047. Stack and drive-around for PAGS at vp 47.

Line went down so vibes quit at 6:30 pm.

February 15, 1997

Gay VerSteeg filling in today.

February 16, 1997

Gay VerSteeg filling in today.

February 17, 1997

5:30 meeting. Late start to field (8 am.). Overcast with sprinkles.

Rack 5125. Moving between swath 1160-1168. Vps 160 to 165 on roads. Avoided rest of resources by staying on flagged route which was surveyed well originally. May not have met exact avoidance criteria for PAGS but fairly close.
Rack 5133. Most PAGS in banks of roads. Shook these vps as is. Vp 65 (PAGS) avoided by stack and drive-around.
Rack 5141. Stack and drive-around at vp 63 for Le Conte's thrasher nest. Stacked at old road and tank to avoid burrows at vp 67.
Rack 5157. Lots of offsets. Vps shook on roads.
Rack 5165. No resources.
Rack 5173. No resources.
Rack 5171. Moving between next swath 1168-1176. No resources. Rain and hail coming down. Need to fix ruts at vp 73, south of rd. Called recorder and advised them to do so.

Quit 4:30 pm. - rained out.

February 18, 1997

5:30 meeting - discussed condition (saturation of soils). I checked out field conditions. It is clear and cold and somewhat damp from rain but is surprisingly well soaked in. We will go ahead with vibing.

Rack 5163 (moving between swath 1168-1176). No resources but drivaround for hills.
Rack 5155. Flags reported missing in source notes were present. Centerstack for PAGS at 5170.5 both high and low side. Cleared turnaround at vp 75.
Rack 5147. Resources flagged along bank including PAGS and PKFD. Shook on road as there are burrows up and down road both directions. Also, PKFD narrows back and is high up on bank - is more likely a PAGS burrow.
Rack 5139. Stack and drive-around for PAGS and Badger dens at vps 72, 73, 74. Mentioned in source line notes that line isn't flagged. Difficult to see, but it went down wash. No resources that portion.
Rack 5131. Vibes allowed to proceed along rack which follows old trail at top of steep ridge inhills. Source notes call the numerous burrows PAGS. These are more like PEMA burrows (small). PAGS usually not in these steep of hills in the middle of trails either - usually in road banks which aren't present here. Avoided what we possibly could even though they are too small. Vibes also had no alternative route since we were up on a virtual switchback. We could not place vps on sides of hills or get down to the bottom of the drainages. This was impossible even moving one or two stations.
Rack 5123. No resources. Long drive-around for terrain.
Rack 5117. No resources.
Rack 5107. AGS observation (burrow flagged). Crossed on east side of flagging to avoid. Dump area with lots of ORV use.
Rack 5099. Stack and drive-arounds for GKR and AGS on rack. Source notes mention old GKR but many were active, obscured by overgrown vegetation. Large scats and ramps could clearly be seen.
Finish 7 pm.

February 19, 1997

Rack 5091. GKR precinct (active) at 70 driven over by jug truck before vibes arrived on site. Flagged, however, problem was that there was only low grass and flagging could not be seen down so low. Also, flagging was faded. Didn't appear to damage the precinct as there was fresh scats and active berms. Moved vp 50 feet west and rolled on drive-around. Vp 71 moved 40 feet east and rolled on drive-around.
Rack 5083. No resources but pipeline drive-arounds cleared.
Rack 5075. Centerstacked vp 70 to avoid GKR and PAGS.
Rack 5067. Moved vp 69 for PKFD 150 feet. This vp had already been skidded so it had to be moved a full station. Pulled flagging at 68.5 because PAGS burrow occluded.
Rack 5059. Stacked on high and low side of PAGS burrow at 5173.5 to avoid.
Racks 5051, 5043, 5035, 5027 - no resources.
Rack 5019. PAGS at vp 75 occluded. Flagging removed.
Rack 5011. PKFD at vp 5169. Stacked and driven around.
Rack 5003. No resources.

Quit at 7:05 pm.

February 20, 1997

Overcast. Vibes started at 7:40.

Rack 5001. Now on next swath 1176-1174. No resources.
Rack 5009. No resources.
Rack 5017. Stacked 77 on high side to avoid ERHO. Came in from north to do this. Did not come in from south as source notes suggested because ERHO would have been taken. Bio surveyor must not have seen road to north. Vp 76 shook on paved road to south. This was a 50 ft. move.
Rack 5025. Very large Arch site. Lead driver called it Bio, but he was corrected for accuracy for the record. The Arch site was much larger than appeared on the map, encompassing quite a bit of a drainage. Source rack itself had no Bio resources.

Rack 5033. No resources.
Rack 5041. Pipe den at vp 78 not mentioned in notes. No fox inside so shook on line. Stack on high side of 5183 to avoid PAGS. Had to drive by close to next vp because no other place to cross wash. Old puppy den at GPL 1184 1043 next to road. Still viable
Rack 5049. No resources.
Rack 5057. Marked BNLL burrows completely obliterated by sheep (very soft ground)
Rack 5065. No resources.
Rack 5073. PAGS at vp 76 avoided by moving vibes over slightly (5 ft). PAGS burrow at vp 82 occluded. Flagging removed.

Vibes quit about 6:40 pm.

February 21, 1997

5:30 meeting. Mike Warrington wants me to speak with Evelyn in Houston regarding oil spill on Chevron lease. He asked me to try to call her later. I managed to break away at about 11 am. to call Evelyn. She basically asked general questions about the spill. I told her I could only comment on the environmental aspect, but that I could not assign blame. I told her I would have Steve Tabor or Mike fax her a copy of my memo.

Clear and sunny today. Vibes starting up at 7:15. Rack 5081. Still on swath between 1176 and 1184. No resources.

Rack 5089. KKFPD at vp 5177. Old Elk Hills den (marked). Checked again before vibes went through, but as notes say very small holes now. Den was checked because of the historic preference for pupping dens and it could potentially have been re-excavated, especially this time of year.
Rack 5097. No resources.
Rack 5105. No resources.
Rack 5113. Stacked and drive around to avoid PAGS at 5179.5.
Rack 5121. Stack on high side of 80 for PAGS. Stack on high and low side of 81 for PAGS.
Rack 5129. Stack and drive around for PAGS at vp 77.
Rack 5145. Stacks and drive-arounds for PAGS at vps 82 and 83.
Rack 5153. Stack and drive-around at vp 77, move and stack vps 78 and 82 for PAGS and GKR. Done a little differently than source notes advised. Vp 82 moved west. Drove from north to powerline then onto 83 which was stacked.

Vibes quit at 6:50 pm.

February 22, 1997

Rack 5161. Still moving between swath 1176 and 1184. Vp 78 stacked on low side. Surveyors called out to field to move for numerous AGS and GKR. No possible route. Moved vps 79, 80, and 81 south to road. Vp 82 stacked on high side.
Rack 5169. Offset vp 78 for PAGS/GKR (GKR appears old). Moved 30 ft. for avoidance. Vp 5181 moved to road.
Move up to next swath. Vibing between 1184 and 1192 now.
Rack 5174. Surveyors out in field. Moved vps 184, 185, and 186 out of HWS area and avoided ridge completely. Trucks wouldn't have been able to make it up the hill anyway. It also would have been a trespass on NPR-1 lands.
Rack 5167. All vps set to road.
Rack 5159. ***Small Mammal Potential Monitoring Site*** Many potential PAGS, BNLL and old or inactive GKR burrows. Lots of other k-rat also. Avoided all GKR intact precincts, but impossible to avoid all other burrows. Moving anywhere just impacts others. For the most part k-rat scat seen (smaller species). Estimated that 23 burrows destroyed by vibes, even taking least impact route. These are potential BNLL and AGS burrows.

Source notes also mention that a jug truck drove through off line. It didn't damage any burrows but it did not

appear to be a jug truck anyway (no dually wheels and obvious sheep activity and old laydown area. I'm sure it was a sheepherder's pickup.

Rack 5151. No resources found but sheep had already been through; numerous truck tracks, trampling, and old laydown area. Resources could have been destroyed before vibes went through. Obliterated area north on hill definitely from sheep (moonscape). Some offsets at last minute for terrain, so surveyed ahead of vibes.

Rack 5143. Pulled resource flagging at 5190.8. Burrow collapsed.

Rack 5135. Moved 50 ft. east and stacked for GKR burrows at vps 184 and 185.

Rack 5127. PAGS on road edge. Shook as is without moving. Burrows are up and down road. Moving just impacts others. Do not want to move out into habitat to avoid either.

Vibes quit approx. 6:40 pm.

February 23, 1997

Did not attend 5:30 meeting. Needed to get with scouts and surveyors out in field to survey offsets for resources. Time consuming with scouts looking for routes for a whole list of offsets. Offset list cleared: 12 84, 03 91, 04 90, 05 89, 07 88, 08 87, 10 86, 96 85, 96 84, 03 91. These offsets were mainly around the county landfill. Sheepherder truck (pickup), water truck, and sheep all around the area. The vehicles are parked at 03 91.

Vibes out in field at 7:15 am. With the exception of offsets jumping crossline we are still working between swath 1184-1192.

Rack 5119. OK - no resources.

Rack 5111. Stayed on road at 184 to avoid PAGS. Stacked high and low side 5185 to avoid PAGS at 5185.5.

Rack 5095. Crossed Elk Hills Rd.. Drove both sides of GPL. No way of knowing what side drive-around was on because not in notes. We needed to get out of the way of heavy traffic and also we could not use the northern side of the cable. It would have meant crossing cable too may times while vibes are trying to get out of the road and scouts are working to bury the line several times. Vibes need to be on the south side due to a puppy den and a drainage which would prevent the vibes from making it to the road. Den was not flagged well. Traffic (unmonitored troubleshooters or juggies) would have run over it. I reflagged it. Stacked for den at 5191. Not active but definitely viable.

Rack . Six-pack centerstack for vp 89. Stayed on road to avoid burrows on sides of banks (no better route). Offset vp 90 45 ft. SE to avoid PAGS, then stack and drive-around. Stack on high side and drive-around vp 90 to avoid PKFD and PAGS.

Rack 5079. OK - no resources.

Rack 5071. Stack on high side of vp 91 and drive around to avoid Burrowing owl den. Burrowing owl sighted on den so made 50 ft. avoidance route so as not to disturb.

Rack 5055. Avoided numerous AGS at 5187-5186 by stacking or driving around using a slightly wider route, and by using roads as much as possible.

Rack 5047. PKFD located at old well site. It is an old Elk Hills den. Den was avoided when surveyors had to offset vp for Arch site (the abandoned well) 55 ft. west (vp 5189).

Rack 5039. Avoided PKFD at vp 84 near GPL intersection. Swung wide and stacked on high side. Five points of this rack done today, will be finished tomorrow.

Vibes quit 6:30 pm.

February 24, 1997

Gay filling in for K.H. today.

February 25, 1997

Gay still filling in until 11 am.

Now working between swath 1192-1200.

Rack 5085. Vibed approx. at noon. Avoided PAGS at vp 193 by stacking and driving around.
Rack 5093. Avoided PAGS by stacking and driving around.
Rack 5101. No resources.
Rack 5109. Flagging removed at vp 97. Burrow is collapsed. Vp 95 OK - vibes will miss because burrow is in bank. Vp 99 was a stack and drive-around for PAGS.
Rack 5117. Old Elk Hills kit fox pupping den at vp 92. Occluded but drove around to avoid anyway, since these dens have been used historically by foxes and could be used again.
Rack 5125. Stack on low side of 95 and high side of 96 to avoid PAGS burrow.
Rack 5133. Surveyors moved from original location. Resurveyed, but no resources.

February 26, 1997

Meeting at 5:30 am. Discussed off-road driving out of surveyed corridors and observing speed limits. Vibes started up in field at 7:50 am. Clear and sunny today.

Rack 5141. OK - no resources.
Rack 5149. OK - no resources.
Rack 5157. OK - no resources.

Now working between swath 1200-1208.

Rack 5147. Stack and drive-around to avoid PAGS at vp 5200.
Rack 5139. Drive-around cleared for pipeline. No resources.
Rack 5131. Stacks and drive-arounds to avoid PAGS and PBNLL burrows at vps 202-204.5.
Rack 5123. No resources.
Rack 5115. Moved vp 5202 50 ft. west for old Eld Hills den 24B-11.
Rack 5107. Stack for pipeline which avoided PAGS at 5205.5.
Rack 5099. BNLL/AGS at 5202.5 stacked
Rack 5091. Stacked and drive-around to avoid BNLL at 5206.5.

Vibes quit at 7:00 pm.

February 27, 1997

Morning meeting 5:30 am.
Vibes late start at 7:30.

Rack 5083. Pulled flagging. No resource.
Rack 5075. Stack on low side for PAGS at 5203.
Rack 5067. No resources.
Rack 5065. Now on next swath 1208-1216. Stack and drive-around for PAGS at 5214.

Misc. note: Leslie (scout for Western) reported to me a white Bronco driving out of corridors near Racks 5172-5192 around the 190 vps. Partial license plate no. ---921 (California plate non-official).

Rack 5073. No resources.
Rack 5081. PKF at 5208 stacked on low side, and at 5209 stacked with last vibe on road. Vp 5213 moved 20 ft. west and stacked for PKFD, stacked at 5214 also for PKFD.
Rack 5089. Pulled resource flagging. Sheep destroyed marked AGS burrow.
Rack 5097. No resources.
Rack 5105. No resources.
Rack 5113. No resources.
Rack 5121. Stacked at 14 for PAGS at base of shrub and rolled on vp 13 far enough away from burrows.
Line down quit at 5:30 pm.

February 28, 1997

Meeting at 5:30 am. Discussed weather in sensitive B.V. Valley.
Vibes started up at 7:30 am but line is going up and down. Then line down until 11:15 am.

Rack 5121. Being completed from yesterday. Stack at 14 for AGS. Rack 5129. Moved 5212 to west 20 ft. Stacked and driven around.
Rack 5137. Avoided Arch site and BNLL on drive-arounds at vps 5208.5-5210.

Vibes are at the top of the prospect, many isolated points difficult to get into.

Rack 5233. Vps only 208-212 (top of prospect this area). Rolling on 10, 11 stack on low side, 12 stack on high side, 13 stack on low side, to avoid PAGS burrows. This is other side of the "zipper".

Vibes quit 7 pm.

March 1, 1997

Vibes started 7:40 pm. Clear and sunny.

Rack 5273. Still moving between swath 5208-5215. *****Small Mammal Potential Monitoring Site*****
Many small mammal burrows. No avoidance possible. Moving just impacts others. Between vps 208-215, estimate that 27 small mammal burrows which are potential BNLL and AGS burrows were destroyed.

Rack 5281. Vp 5210 has known kit fox den. May be a pupping den, but no puppy scats present. Elk Hills den marked 5B-67. Possibly very old as K.H. has recollection of it 10 years ago while studying foxes at Elk Hills. Move vp 50 feet N/NW to avoid by 100 feet. Vibes traveled down GPL to west. Nice flagging of badger den in corridor by Bio surveyors. Flagging has greatly improved since Dave, Will and Joe came on.
Rack 5205. Vps 208-215. Drivaround put in for vibes at wash between 210 and 211, however vibes decided to stay in main corridor and traverse wash straight on (steep). Got through OK.
Rack 5213. Last rack of the day.

Vibes quit at 6:05 pm.

March 2, 1997

Meeting 6:00 am.
Vibes starting closer to 7:45 pm.

Rack 5319. Working between swath 1216-1224. Vibes will be stair-stepping up and down the "triangles" that abut NPR-1 lands. Impossible to keep good written notes as the monitor will be in the "Gator" riding with the scouts. The routes are difficult and have many changes. Any resources destroyed will be written up and described, but otherwise there is no opportunity while riding along. The effort will be put toward finding avoidance routes and protecting the resources all in a timely manner for the project. It is not possible to write while in the "Gator", or to constantly stop production to write lengthy notes.
Rack 5327. Stacked 22 on the high side for BNLL/AGS. Cleared drive-around to the east. Stack at vp 19 for marginal GKR.
Rack 5335. Stack on 16 and 17 for old kit fox den that is mainly collapsed but worth keeping distance from. Sheep moving into the area. We are currently in the 6B/31R area.

Continuing stair-step up. Finished on 5337 (5214-5208).

Sheep truck driving across source lines south of Silus Acres road (main pipeline road which is continuation of Valley West Rd.) west of 6B hilltop.

Vibes finished at 6:30.

March 3, 1997

Meeting 5:30 am. Scattered clouds, cool.
Vibes starting up at 8:00 am.

Rack 5345. (208-214). Stack in six-pack high side for PAGS/BNLL burrows.
Rack 5353. Stack at 5215 for Bio flagged at the GPL intersection.

Have moved out of the "triangle" and are now moving east across the swath 1200-1208 toward the zipper.

Rack 5323. Stack for kit fox den 31R-10 on both high and low side to get 100 foot clearance.

Vibes have been in the 31R flats most of the day and not much for resources. Very heavy grasslands.

March 4, 1997

Still on swath 1200 to 1208 moving east.

Rack 5315. Old kit fox den off 6B ridge road. Mostly collapsed. Two open lower entrances. Since nowhere else for vibes to go on the ridge without impacting other better dens, and we are on a well traveled ridge road, vibes shook within 100 feet (70 ft.) from known den. Den is marked 6B-14, which is an old Elk Hills den. It is not now active.
Rack 5307. Elk Hills den at vp 04. Old den but stacked for more clearance as the ridge is an historically active area.
Rack 5299. Stacked and drove around all resources. Also walked GPL route vibes are taking. Many kit fox pupping dens. Followed jug tracks through which did a good job of avoidance.
Rack 5291. Kit fox den at 5205.5 in wash. Stacked at edge of wash on both high and low sides since it was viable and showed signs (scat) of old activity.
Rack 5283. Many small mammal burrows which are potential BNLL and AGS burrows. Good habitat. Could not avoid since moving anywhere else just impacts others. ***Small Mammal Potential Monitoring Site*** Estimate 29 burrows destroyed by vibes going directly over. At vp 07 is an old Elk Hills historic pupping den (5B-17). Surveyors moved vp to road to avoid impact to den.
Rack 5275. OK - No resources.
Rack 5267. Very active short-nose area with some burrows obviously good for BNLL and PAGS. Nice flat habitat in B.V. Valley. The vps involved include 207-205. No real avoidance possible since moving just impacts others. ***Small Mammal Potential Monitoring Site*** Estimate vibes destroyed 56 burrows. Vp 204 moved 35 feet west for BOB and old known kit fox den Elk Hills 5B-10. Vp 203 avoided PKF/BOB. Vp 200 moved 50 feet east for GKR.
Rack 5259. Stacked at 01 and 02 for GKR.
Rack 5251. Had vibes set up on left side of flag to give enough clearance without moving for resource at 5207.
Rack 5243. Moving down GPL to get to rack. Very slow and time consuming. This GPL had been barricaded by J. Jennings even after we agreed there would be no barricading. There are many GKR but they cover the whole area and actually as I have scouted around, the GPL is the best route because it is on the edge of a wash where there are less precincts and I can get vibes through. However we are not doing too badly for meeting the criteria for distance or at least feeling fairly safe in the few places where we don't. **Small Mammal Potential Monitoring Site**

Vp 200 moved 50 ft. west for GKR. Vp 203 stacked on low side for Kit fox den. Vp 204 stacked on high side for same den. Vp 205 centerstacked for Kit fox den. Vp 206 moved 40 ft. west and stacked for kit fox den.

Rack 5235. Started rack, no problems yet.

Vibes stopped at 6:00 pm. Vibe broken down. Will start here tomorrow at vp 204.

March 5, 1997

5:30 meeting. Discussed problem GPL areas which Jim and Gay were not supposed to barricade causing problems getting vibes through and all time cost. I explained I am working through the areas as fast as I can and there shouldn't be too many more.

Vibes still on swath 1200 to 1208. Started back up on rack 5235 vp 204. 204 stacked on high side. Drive-around to 36 205 and center stacked for resource. Cleared drive-around. Stacked vps 201 and 200 for GKR. Vibes had to traverse wash along D.O.E. boundary. Could not cut across to road because this route would be a D.O.E. trespass.

Rack 5227. Offsets - no resources.
Rack 5211. Offsets - no resources.
Rack 5203. No source notes at this time. Surveyed and avoided resources as needed ahead of trucks. Driving along in the "Gator" works best since without source notes I have no prior knowledge where the resources are on the racks. Therefore, I can't leave to scout ahead for Western.
Rack 5195. No source notes at this time. Surveyed and avoided resources as needed ahead of trucks.
Rack 5187. No source notes at this time. Surveyed and avoided resources as need ahead of trucks.

Now we have moved all the way down to EOL on swath 1192 to 1200.

Racks 5373, 5365, 5356, 5349, and 5341 were in the hilly areas of the 35Z ridge. Resources were generally very light and due to the drivarounds or offsetting that occurred for terrain, some Bio sites that were flagged were not even near where we were going. Very busy though, finding routes that vibes could get up. Lots of surveying ahead of trucks. Resources, if present, were all avoided; no takes recorded.

Vibes stopped at 7:00 pm.

March 6, 1997

Meeting 6:00 am.
Still working on swath 1192-1200.

Temporarily have no source notes while Bio surveyors are getting caught up. Monitoring done in front of trucks. No real time to write notes. Same situation as described above. See source notes when completed by surveyors for record of resources. Racks vibed include: 5333, 5325, 5317, 5309, 5301, 5293, 5285. These racks had no Bio resource flagging on them. Racks 5277, 5269, 5261, 5253 had a few sites of flagging but some of these routes were altered due to terrain so had to be resurveyed anyway. No takes on resources. Avoidance possible one way or another.

Vibes quit at 7:00 pm.

March 7, 1997

5:30 am. meeting.

Still working without source notes because Bio surveyors not caught up with surveys and/or note typing.

Still vibing along swath 1192-1200.

Rack 5245. Vp 198 stacked & drive-around 30 ft for GKR. Vp 199 moved 50 ft west to avoid active GKR.
Rack 5237. Clearing last minute routes. Resources avoided. No resources on original route.
Rack 5231/29. (with offsets). In sump areas (9B sumps). Difficult getting through terrain. Finding last minute routes and avoided all resources. AGS burrows listed at vp 5195. These were avoided.

Burrows at 5191 in too soft sandy area. Most of these were occluded. Missed the viable ones by driving around. Cryptogamic soils mentioned in source notes is widespread - no possible avoidance for all of it.

Lots of alternate routes had to be found, and routes around GKR on barricaded GPLs. *****These areas should be looked at by the geophone monitors for possible small mammal monitoring areas***** They are in charge of identifying and setting these up. They were to go through any notes that mentioned barricaded GPLs, clearing them, and finding routes through for vibes ahead of time. Then put them on a monitoring list. They should return to check these since vibes obviously don't travel every portion of GPLs.

K.H. left at 1:30 pm. and Dave filled in for the rest of the day.

March 8, 1997

K.H. on day off. Dave filling in for vibe monitoring.

March 9, 1997

K.H. on day off. Dave filling in for vibe monitoring.

March 10, 1997

5:30 meeting.
Vibes started up at 7:10 am.
Now moving between swath 1184-1192.

Rack 5207. Numerous pipelines. Drive-arounds cleared.
Rack 5215. Avoided BNLL at 186. Flagging pulled at 5184 for occluded PAGS/PBNLL burrow.
Rack 5223. Washy area in wastewater pond areas but lots of burrows which could be PBNLL or PAGS. *****Small Mammal Potential Monitoring Site***** Estimate that 10 burrows were destroyed by vibes driving through necessary route.
Rack 5231. Avoided kit fox den at 5189 on drive-around by stacking. Stacked for PAGS burrows on high and low side of vp 184.
Rack 5239. Stack and driveround for kit fox den at 184. ***** Small Mammal Potential Monitoring Site***** Lots of burrows unavoidable. Estimate 21 burrows taken between vps 181-183 especially.

Now moving between swath 1176-1184.

Rack 5361. No resources. Hilly area. Cleared alternate routes ahead of vibes.
Rack 5353. No resources. Hilly area.
Rack 5345. No resources. Hilly area.
Rack 5337. Hilly area. Avoided burrows at vp 178 and and PKFD at 177.
Rack 5329. Avoided PKFD at 179. Cleared drive-around for wash.
Rack 5321. No resources. Still very hilly.

March 11, 1997

6:00 am. meeting
Still working between swath 1176-1184.

Rack 5313. Hilly. Cleared drive-arounds for vibes. No resources.
Rack 5305. Drive-arounds cleared - avoided all resources.
Rack 5297. Drive-arounds for wash cleared. BOB missed because den was in wash bank where vibes aren't going.
Rack 5289. No resources.
Rack 5281. Vp 176 shook on road to avoid Elk Hills den 8B-7. Also stacked on low side. Vp 177 OK. Vp 178 has ruts on side of hill, right off 8B ridge road at curve. Told scouts and recorder these

need to be repaired. Ground very soft. Ruts are in several sets 6-10 inches deep, about 20 feet long.

Rack 5265. Very large Arch site at knoll out to old well site. Lots of dumping and glass. Avoided. Elk Hills kit fox den down in wash avoided due to drive-around route.

Rack 5256. Old small mammal area. Not much open or active to avoid. Rolled on vibes, sometimes slightly wide to avoid anything looking active or viable.

Rack 5241. Avoided GKR at vp 180. ***Small Mammal Potential Monitoring Site*** Estimate about 12 burrows taken. Unavoidable take of PAGS/PBNLL because moving impacts others and there are no roads to move vps to.

Vibes quit 7:00pm.

March 12, 1997

Meeting at 6:00 am. but not attended by K.H. Out in B.V. Valley looking at sensitive areas ahead of vibes.

Still vibing between 1176-1184 swath.

Rack 5233. Cleared drive-around for washes and avoided resources.

Rack 5225. Avoided PAGS/PBNLL burrows at vp 178. Vp 25 83 located on finger of land between large and small wash. No where to move point. Backed vibes back over GPL line (1184). Arranged vibes this way because a six pack would have been too wide between the fingers of land, and wash sides may have given way (unstable). Burrows and old viable known Elk Hills den in bank. Too hilly on one side to move vp and wash too difficult for vibes. It also was a nice wildlife corridor.

Rack 5217. Shook beside old badger den at top of hill. Monitored by den while shaking. Didn't have fox sign, also a very steep hill. Not good habitat.

Rack 5209. Steep. Cleared drive-arounds ahead of vibes avoiding resources.

Rack 5201. Stack and drive-around for PKFD at 177.

Rack 5193. Avoided cryptogamic soils as was possible. Avoided Elk Hills known KFD 15B-26.

Rack 5185. Took some time to sort out and flag a route around the GKR precincts which would be clear to drivers at vps 177 and 178. Flagging at completely decimated ones removed.

Rack 5177 No resources.

Now vibing between swath 1168-1176.

Rack 5179. Cleared pipeline drive arounds. Avoided cryptogamic soils as was possible.

Rack 5187. Nice area of 22B. Historic for lots of kit fox activity and pupping dens. Kit Fox Pupping Den (Elk Hills 22B-4) at vp 169 down in wash. Den was moved 110 feet NW onto very top of ridge. One of the scouts informed me that approximately one month ago a kit fox was seen at this den digging out the entrance.

Vibes quit at 6:30 pm. I mentioned that this area was too active to start a new rack and that I wanted all activity out of the area by dark.

March 13, 1997

6:00 am. meeting.
Still vibing between swath 1168-1176.
Cool, some clouds today.

Rack 5195. No source notes. No resources on line. Resource flagging at intersection of GPL. Vibes stacked to meet distance criteria for GKR burrows.

Rack 5203. No resources.

Rack 5211. Stacked at 168 to avoid GKR. Stacked on high and low sides to avoid old badger burrow at vp 74.5. Still had to drive by (but not shake) fairly close to burrow. ***Small Mammal Potential Monitoring Site*** Lots of PBNLL/AGS burrows in area of crypto crust. Avoided as well as

possible, but estimate takes at 23 burrows.

Rack 5219. Stack for PAGS/BNLL at 173 at edge of well pad. This is poor for BNLL because it is in high 15B hills, however Bio surveyor may have seen something I didn't. At any rate, is viable opening and looks good for PAGS. Vps 168-169 have many burrows in bank, but vibes not going there.

Rack 5227. Cleared drive-arounds for vibes. Avoided resources and stacked for PKFD at 5173.

Rack 5235. Flagging at Kit fox den and GKR removed. Very old and collapsed. Lots of small mammal burrows scattered along route and no real avoidance possible. Moving just impacts others. *****Small Mammal Potential Monitoring Site***** Estimate that 19 burrows taken which are PAGS or PBNLL.

Rack 5243. Avoided small mammal burrows. These were mainly in wash where vibes drove around. Also kept vibes to roads when possible.

Rack 5251. GKR between vps 174 and 173. Vibes allowed to skirt resource flagging because burrows mostly decimated, but worth avoiding for future colonization (maybe a long shot). This is a DOE study site and old GKR/small mammal trapping area in 8B. They have not trapped here for several years when the scientists felt there was a die-off.

Rack 5259. Skirted old GKR precinct at 175. Pretty decimated but worth avoiding. Lots of small mammal burrows. *****Small Mammal Potential Monitoring Site***** Other species colonized old GKR burrows, even these appeared inactive. Potential for BNLL and AGS. Estimate that 27 burrows were unavoidably taken when vibes went over route. Still part of old DOE study area.

Rack 5267. No resources.

Vibes stopped about 6:05. Long drive out. We are back in the 8B hills in the R.V. Bowl area.

March 14, 1997

6:00 am. meeting.
Started vibing about 7:15 am.
Still vibing swath 1168-1176.

Rack 5275. No resources on rack but we are in the 8B R.V. bowl area and there are lots of resources in the area (mainly kit fox dens and AGS).

Rack 5283. No resources.

Rack 5291. 7B hilltop and ridge. No resources immediately on route but dens below im banks.

Rack 5299. No resources.

Rack 5307. Difficult terrain. Cleared several drive-arounds and avoided resources.

Rack 5315. Difficult terrain. Cleared several drive-arounds and avoided resources.

Rack 5323. Avoided PKF while clearing drive-arounds for different route.

Rack 5331. Den mentioned as active in source notes is definitely not, but is a viable known kit fox den (Elk Hills). Stacked and drove around.

Rack 5339. OK.

*** all of the above racks were in the 7B/8B hills and ridges. Soils were extremely unstable and there were few roads. Many old trails existed, but these were extremely soft as well. Vibes were getting stuck numerous times and many alternate routes had to be found. This was all very time consuming. The recorder was notified that the whole area would have to be checked for rehab and restoration, especially since the juggies would go back through again impacting it further. This message was also passed onto Steve Tabor to go over the whole area. This was after K.H. left the project due to illness.

Vibes quit at 6:40. Active area and long drive out.

March 15, 1997

6:00 am meeting.

Clear and sunny. We have had quite a warm stretch with no precipitation or fog for quite a while. Dust areas on roads are getting very bad.

Still vibing between swath 1168-1176.

Rack 5347. No resources. Disturbed area.
Rack 5355. No resources. Disturbed area.
Now vibing between swath 1160-1168.
Rack 5349. No resources.
Rack 5341. Stack for old kit fox den (mostly collapsed) at vp 61.
Rack 5333. Removed flagging at vp 164.4. PKFD collapsed.
Rack 5325. Stacked (six-pack) and moved 30 ft. for PKFD/Badger at 163 and 167.
Rack 5317. No resources. Cleared drive-arounds.
Rack 5309. No resources. Cleared drive-arounds.
Rack 5301. Vp 64 offset for kit fox den with scat avoided.
Rack 5293. No resources.

Stopped vibing about 6:00 pm. Long drive out.

March 16, 1997

5:30 meeting.
Vibe testing early morning.
Still vibing between swath 1160-1168.

Rack 5269. Lots of crypto and small mammal burrows. Unavoidable takes for PBNLL and PAGS. Moving just impacts others. ***Small Mammal Potential Monitoring Site*** Estimate that 30 burrows between vps 165-167 were destroyed by driving over.
Rack 5261. BNLL avoided at vp 162. Other burrows no possible avoidance. Moving just impacts others. ***Small Mammal Potential Monitoring Site*** Estimate that 5 burrows were destroyed by vibes driving route.
Rack 5253. Drive-arounds cleared for washes. ***Small Mammal Potential Monitoring Site*** Estimate 16 PBNLL/PAGS burrows destroyed driving on route.
Rack 5245. Stack and drive-around for BNLL burrows at vp 162. Rough terrain with washes.
Rack 5237. Avoiding crypto and burrows as possible. However moving impacts other burrows. ***Small Mammal Potential Monitoring Site*** Estimate take of 27 PAGS/PBNLL burrows.
Rack 5229. Finding route ahead of vibes avoiding crypto and burrows as possible. No complete avoidance possible. ***Small Mammal Potential Monitoring Site*** Estimate a take of 21 PBNLL/PAGS burrows.

Vibes stopped about 6:00 pm.

Note: Due to illness K.H. left project and other monitors took over.

VIBE MONITORING
MIDWAY 3D SEISMIC PROJECT

29 January 97
5:30 Meeting
6:30 Drove out to north edge of Ford City.
7:00 Vibing Swath 13.
5069 Rack - very disturbed area (RV's, roads).

Weather overcast; no rain.

First vibe point 50695103. Lots of offsets today (offset into next swaths, north and south). Vibe tracks in habitat made a few ruts in moist areas. Overall not bad. OK to vibe.

SL 5077 offsets (2 SP's per moved point due to pipeline).

SL 5083 to have ruts restored. Called in. This rack has deep ruts but is in previously disturbed area. Next rack appears drier.

SP 50855099 PAGS on line. Follow flagging to N to avoid by 30'. (Vibes followed flagging correctly.)

Recontouring of ruts being done by jug crew by hand. Met with crew chief to demonstrate how to restore the habitat, especially the deep ruts or cuts. He understood and did an area while I watched.

5093 Rack
50935009 Offset. No resources found. Damage repaired.
50935093 Offset. No resources found.

Damage to habitat on 5093 looks OK; drier than earlier in day. Few areas have ruts.

50935102.5 PKF flagged in island in wash. Rigs will vibe 9302, back out, and drive around to 9303, avoiding PKF and wash.

5101 Rack
51015103 No resources found.
51015102 Habitat needs restoration by hand.
51015093 Offset. No resources found.

Vibes went back up this line at request of recorder.

5109 Rack
51085109 Offset. No resources found.
50175109 Offset. No resources found.
51095093 Offset. No resources found.

Recontour GPL 1096 route travelled. Near 51115094.
51125093 Offset. No resources found.

51155096. No resources found.
51165097. No resources found.
51165098. PAGS S of SP. Flagged W to avoid.
51175102. No resources found.
51175103. No resources found.

5125 Rack
51255100. PGKR. SP moved 50' N. to avoid resource. Drive into SP and back out.
51255099. PAGS on line and PKF 30' N. Moved SP 100' S. Drive S from 5100 to this SP to avoid resource and other obstacles in area. Monitored rigs closely and all went well.
51255098. PAGS. Flagged drive around to N to avoid PAGS by 30'.

5133 Rack
51335097.5. PAGS. Flagged drive around to S to avoid by 30'.
51335097. PKF 60' SW. Follow flagging exactly from road to NW to avoid by 50'.
51335093. No resources found. Cleared access to road to S.
51335100.5 Pulled flag on PBNLL. Holes went nowhere.

Rigs stuck in wash on 5127 Rack (near 51275094). Needs rehab. Called in to recorder. Rehab 5125 Rack, too. Good habitat and washes.

Tomorrow at meeting bring up staying on the tracks and roads by rehab people. No turn arounds on access lanes. Prefer that they walk in.

Rigs parking in a previously cleared parking area by dirt road.

51335096. Last vibe point 6:15PM.

In office at 7PM.

VIBE MONITORING
MIDWAY 3D SEISMIC PROJECT

30 January 97

5:30 meeting. John brought up my issue of the need for the jugs to walk in or drive carefully on vibe tracks when doing repairs.
7:00 called recorder and said all was ready for vibing on first vibe point 51335097 (swath 13).
7:30 Began vibing.

Weather: Overcast and clearing. Soils are not saturated. Minor ruts.

51335109 Offset. No resource found. In old reveg area.
51415109 Offset. No resource found. Can roll NE to 2 track and drive out to gravel road.

Rehab 51335103 (called in).

51415193 Offset. No resources found. On disturbed shoulder.

5149 Rack
51495102 Wierd flagging in short straight lines about 150' apart. Arch flagging? Tracks in area. Non-seismic? Stack and back out.

51495109 Offset PAGS 30' W. Flagged to avoid. In reveg area.

NOTE re: 5149 Offsets
These offsets take as much time to locate, walk and clear as an entire rack. There are two offsets for each lost SP. It is going to be impossible to be with the rigs properly, clear these new offsets and prevent damage to the habitat. Recorder notified of possible delays. Other biologist came to clear 4 offsets. Took 3 hours to clear the offsets.

Rehab areas at 51495096 and 51495098. Called in.

5157 Rack
51575109 Offset No resource found.

51585102 to 51575103 No resource found.

51575093 Offset No resources found. Access from 51575096.

51575096 Pulled flagging on dead end holes. Access on SL OK.

Rehab 51575099 Wash damaged by vehicles. "Turn and back" area had to be cleared. Rehab wash and slopes.

51655093 No resources found.

51655106 No resources found.

51655097 KKFD 15' N. Moved SP 5097 and 5098 150' N.

51655097 and 51655098 moved 150 N to avoid KKFPD.

51655096 Flagged KKFPD 150' NW of SP. Not in notes.

Rehab 51655093 Called in.

Rehab 51655099 SL and wash. Called in.

51655109 Offset. PBNLL 25' from SP and PAGS 45' from SP. Moved SP 5' S to avoid resource. (JJ cleared offset)

Rehab 51655109 slope and wash. Called in.

51735109 No resources found. Next to road. Vibed in road.

51735102 PKFD. Moved 40' S.

51735097.5 PAGS. Drive around. Stacked rigs at SP to avoid.

Swath 14
51715104 No resources found.

51715107.5 PKF. Follow flagging to S to avoid by 50'.

51715108 PAGS. Moved SP 30' SE to avoid (looks like entrance is part of old KFD (not anymore).

Rehab 51715108 Wash and slopes. Called in.

Rehab 51715111. Called in.

Rehab 51635109 Wash and nearby areas.

Last SP vibed 51635104. 6 PM

Start of day is at 5:30AM tomorrow. 6:30 earliest start time to vibe with monitor present. 5155 Rack tomorrow.

Recorder stated there were no people to do rehab today.

End of day. Last vehicle in field left at 6:45.

Chevron Inc./Santa Fe Energy
Midway Valley 3D Seismic Survey Project
Southwestern Kern County, April 1997
Field Notes for Rich Morrison

Vibe Monitoring: Start and stop points for the day are given as well as any changes made in routes or source points for resources.

April 13: Weather clear, sunny, high of 75 F.
Start was covered by Dave Dayton.
Stop 5181/5071

April 14: Weather clear, sunny, high of 80 F.
Start 5183/5063
Stop 5254/5056
5223/5061 was offset for PKFD
Route between 5239/5056 and 5057 was changed for PASB

April 15: Weather clear, sunny, high of 85 F.
Start 5266/5063
Stop 5237/5048
5271/5056 offset PASB
5279/5057 offset PKFD
5279/5059 offset PKFD
5286/5057 offset PKFD
Route change 5289/5057 to 5056 PBNLLD
5289/5055 offset PKFD
Route change 5281/5049 to 5048 PKFD

April 16: Weather clear, sunny, high of 85 F.
Start 5249/5048
Stop 5179/5040
5217/5052 offset PKFD
Route change 5217/5048 to 5047 PKFD
5179/5042 offset PKFD

April 17: Weather clear, sunny, high of 90 F.
Start 5181/5039
Stop 5221/5039
5205/5037 offset PKFD
5175/5047 offset PASB
5191/5044 offset PKFND

April 18: Weather clear, sunny, high of 90 F.
Start 5219/5040
Stop 5261/5032

April 19: Weather Partly cloudy, high of 75 F.
light rain last night
Start 5263/5032
Stop 5291/5044

Geophone crew worked laying lines on April 13th, 14th and 15th. This was in areas all ready surveyed and their equipment did not leave existing roads. From the 16th on the were working on pick-up of the lines.

Species List

Mammals

Vulpes macrotis mutica	San Joaquin Kit Fox (R)
Canis Latrans	Coyote (R)
Lepus californicus	Black Tailed Hare (C)
Sylvilagus audibonii	Audubon Cottontail (C)
Spermophilus beecheyi	Ground Squirrel (C)
Ammospermophilus nelsoni	San Joaquin Antelope Squirrel (U)

Herps

Arizona elegans	Glossy Snake (R)
Uta stansburiana	Side Blotch Lizard (U)

Birds

California Quail	*Callipepla californica* (C)
Common Night Hawk	*Chordeiles minor* (R)
Horned Lark	*Eremophila alepstris* (C)
Loggerhead Shrike	*Lanius ludouicianus* (C)
Mourning Dove	*Zenaida macroura* (C)
Western Kingbird	*Tyrannus verticalis* (U)
Western Meadowlark	*Sturnella neglecta* (C)
Bullocks Oriole	*Icterus galbula bullockii* (U)

C = Commmon(seen daily)
U = Uncommon(seen two to three times)
R = Rare(seen once)

MIDWAY 3D MONITORING NOTES

3 December 1996

Checked with jug trucks at 1012 1158 (oil field area), talked with drivers and they said they would be stating on the roads the rest of today. I said we would check back with them this afternoon.

Checked back with jug trucks after lunch. They were in the same area as before lunch. I talked with them and they did not think they would be out for a while.

9 December 1996

Talked to jug truck driver near station 1056 1072, he said they would be staying on roads and he would call me if they were going to need to drive off road. I drove around looking for jug trucks and checking the lines bbetween Fellows and 1072. I saw no reason to believe they have not been staying on the roads. I saw no truck tracks off road near their cable.

15 December 1996

Met Kristie at Western office and stayed with her until 1330. Very little of an instructive nature was going on. I got a very general idea of what vibe truck monitoring was all about and got answers to a few questions that will help if I monitor the trucks.

Compliance Monitoring

Spot checked several lines that had been laid out and taken up.

1024 1277(EOL) to 1024 1274 - Looked good, no vehicles were on line, no trash noticed.

1008 1267 to 1008 1263 - Area along line appears undisturbed.

1000 1261 to 1000 1250 - Area along line appears undisturbed.

1024 1263 to 1024 1260 - Area along line appears undisturbed except for quad tracks from 1024 1261 South over the hill to 1024 1262.

1016 1248 to 1016 1243 - Area along line appears undisturbed

except for 2 pieces of duct tape left on line which I picked up.
1000 1247 to 1000 1242 - Area along line appears undisturbed except for 1 piece of duct tape left on line which I picked up.

1008 1212 to 1008 1219 - Area along line was disturbed only by quad tracks along line only.

1012 1212 to 1012 1219 - Area along line appears undisturbed.

17 December 1996

Going over past survey notes and getting them in order and in a neater form.

Meeting with Mark and Dave.

Back to putting past survey notes in order.

18 December 1996

Working with source line survey notes and printing them out.

Meeting with Mark and Dave.

19 December 1996

Typing source line notes and getting survey notes in shape.

Geophone Layout and Monitoring and Compliance Checks

1043 1253 - GPL layed out and removed, habitat appears undisturbed, flagged resource undisturbed.

1056 1195 to 1056 1192.5 - GPL still on ground, truck travel along line stayed in 50' corridor

1048 1193 - GPL still on ground, no vehicle travel cross country, habitat appears undisturbed.

1048 1146 - GPL still on ground, no vehicle travel cross country, habitat appears undisturbed.

1056 1146 - GPL still on ground, no vehicle travel cross country,

habitat appears undisturbed.

1040 1151 - GPL still on ground, no vehicle travel cross country, habitat appears undisturbed.

1032 1155 - Oil field area, GPL still on ground, no habitat disturbed.

GPL 1064

1089 - Jug truck traveled cross country along line, made a turn around, part of which was outside the 50' corridor. I surveyed the area outside the 50' corridor driven on and found no resources damaged.

1089 to 1076 - GPL still on ground, truck travel cross country, no resources disturbed, stayed in 50' corridor except at 1089.

20 December 1996

GPL 1000

1220 - ATV tracks along line only on either side of this station.

GPL 1008

1233 - Another crew is laying out here (the first crew I checked was on GPL 1024 below). Jug truck is staying on roads and tracks made by vibe trucks.

GPL 1024

1214 - Pin flags were removed here by mistake when the cable was taken up the first time. Cable is being layed out by hand, 3 men on the ground laying out cable and pushing geophones into the ground. A jug truck drove up on existing road. Line surveyors were resurveying line as cable is being layed out. Lay out crew got more cable from jug truck and it left on existing road and drove around to my position. Lay out crew is following flagged route closely. When they lay out cable past a station 6 geophones are connected to each other by wire and are connected to the main cable at one point by a plug. All 6 geophones are pushed into the ground about 4 or 5

inches.

21 December 1996

Gave Kristie and Rusty updated version of SL survey notes. Was told that they are laying out the 1072 line and I am going to monitor today.

GPL 1072

1240 - They have layed out from 1240 to 1108. Some jug truck tracks along line in places and some line layed out by foot travel.

1224 - Off road travel along line begins here.

1213 - Lay out by foot here.

1184 - Jug trucks tracks off road along line within 50' corridor only.

1176 - Jug trucks tracks off road along line within 50' corridor only.

1163 - Jug truck tracks off road along line within 50' corridor only N of this point, line being layed out on foot S of point.

1086 - N and S of this point line is close to a road and jug truck is using road.

When jug truck is driving along the line, either along a road or off road along the line, the process is as follows: The jug truck driver or a helper drops off cable and/or geophones at intervals along the line and other helpers are on foot laying out the cable and pressing the geophones into the ground and plugging them into the cable.

1080 - A flagged resource was avoided.

1076 - Jug truck drove outside 50' corridor at one spot to turn around instead of backing back to road.

1059 - Line enters Taft.

Checked GPL removal W of Taft, only quad tracks could be seen along line. Checked lines 1128 and 1120 off of Hill Road.

26 December 1996

Typing survey notes for purpose of monitoring vibes after travel back to Taft from Christmas off.

27 December 1996

Typing survey notes for purpose of monitoring vibes for half of day.

28 December 1996

Typing survey notes for purpose of monitoring vibes for half a day.

29 December 1996

Typing survey notes for purpose of monitoring vibes for half a day.

30 December 1996

Typing survey notes for purpose of monitoring vibes.

31 December 1996

Typing survey notes for purpose of monitoring vibes.

1 January 1997

Typing survey notes for purpose of monitoring vibes.

2 January 1997

Typing survey notes for purpose of monitoring vibes.

3 January 1997

Went to AM meeting at Western.

Had a meeting with Rex.

Typing survey notes for purpose of monitoring vibes and GPL layout monitoring.

4 January 1997

Went to AM meeting at Western. Type survey notes for purpose of monitoring vibes and GPL layout monitoring.

5 January 1997

Went to AM meeting at Western. Typed survey notes for purpose of monitoring vibes and GPL layout monitoring.

6 January 1996

Went to AM meeting at Western, gave GPL drive notes to Rusty. Typed survey notes in AM. Found Kristie after lunch, gave her updated Source Line Survey notes, and stayed with her monitoring vibes the rest of the day.

7 January 1997

AM Meeting

Typing notes.

Monitoring GPL Pickup and Layout

Because of terrain and cross country travel by jug trucks, only spot checking is possible.

1024 BOL to 1024 1050

Pickup is being done on foot in this area of the line. The terrain in this area is steep and hilly. The Western van was left near the BOL, the line was picked up by people on foot. The jug truck would drive to a point it could get to on existing rds. a distance up the line and wait for the men on foot picking up line. It would collect the line and go to the next point along the line to meet the men again. At some point the jug truck would take everyone back to the van and it would move up and the process would begin all over again. Both the jug truck and van are staying on existing roads. When enough line was picked up, the whole crew would go out to 1080 and lay the line out moving South.

1080 1239 - Past 1080 1160

The line picked up on 1024 was being layed out on 1080 from 1239 toward the South. The terrain in this area is flat for the most part and the jug truck is being driven cross country along the line. All truck tracks observed were within the 50' foot corridor with one exception. At the

dirt road just North of 1080 1239, there are truck tracks that go just off road and turn around in habitat instead of backing out. These tracks may be older tracks and not caused by layout today.

8 January 1997

GPL 1080 - Layout

1084 - Truck tracks off road on line and within 50' corridor in both directions from this station.

1103 - Line layed out, trucks have driven along line but they are staying within the 50' corridor.

1104 - Just N of station, truck tracks 45' off center of line, going to rd., no resources disturbed in tracks.

1105 - Truck tracks off line 63' W of center line. Two sets of tracks a distance apart going to and coming from a rd. near the line. No resources disturbed in tracks.

1107 - Truck drove off line up unsurveyed wash W of line about 156', no resources found in tracks.

1109 - Shallow wash, truck trucks off line 60' W of center line and 33' E of center line. Part of wash torn up a little, more than one vehicle has been here, or one vehicle several times. Some deep ruts and torn up ground. No resources found in previously unsurveyed areas that were driven on.

1110 - PAGSBs just N of station, flagged resource was avoided by truck on line.

GPL 1088

1070 - Residential area of Taft south of this station.

1070 to 1098 - Observed GPL being layed out, truck drove partly along parallel road and partly off road on line within the 50' corridor.

1123 - Truck tracks from rd. 54' E of center line going to line. No resources disturbed in tracks. Truck stayed on line within the 50' corridor N of this point.

1136 - Truck tracks along line off road within 50' corridor, some deep ruts in soft sandy soil.

1152 - Truck tracks along line off road within 50' corridor.

1206 - Observing line being layed out. Juggys came from South toward me laying out line, van stayed on existing roads. One jug truck drove off road on line within the 50' corridor and the second jug truck, which was supplying the first, stayed on existing roads. Second jug truck stopped and the driver (Name?) asked me if they were doing OK, if there were any problems and I told him about the things I have found today (see above), and I said that I thought it was possible some of it was done by the trouble shooters as well as some done by jug truck drivers. The driver said he would bring it up in the meeting the next morning. The first jug truck driver also stopped when he got to my position and asked about driving problems and I explained to him about the 50' corridor that they were allowed to drive in because it had been surveyed but anything outside that corridor that was not a road had not been surveyed and therefore should not be driven on. Both truck drivers were very cooperative and wanted to do things the right way to avoid harming resources.

The process of laying out GPL that I observed is as follows: The jug truck drives along line or parallel road and drops off GPL, geophones and boxes (amplifiers, transmitters?), the people on foot (juggys) lay out line, deploy geophones, etc., the van is support and mostly stays on roads.

1237 - Line was layed out to 1237 when I left.

GPL 1024 - Pick up

1087 - Checked line at this point at about 10:00 AM and it had not been picked up yet.

1091 - Truck tracks inside Arch. site exclusion flags just off a dirt rd., a truck made a big circle off road, inside arch. flagging and ran over an exclusion flag. Quad tracks go up line from there.

1137 - Line not picked up yet when I got there. Western van arrived just after I did. This area is oil field with steep terrain and many pipelines and GPL is being picked up on foot. The oil fields goes on for a ways North from here.

Informed Western Geophysical (Rusty Gentry) of all driving outside 50' corridor problems. He said he would talk to crew about the problem.

11 January 1997

Went to AM meeting and monitored vibing for most of mourning. Kristie brought up off line driving she had observed at morning meeting and the entire crew was informed that this was a problem that should stop.

Monitoring Geophone Layout after surveying for part of day.

GPL 1096

1086 - From BOL to this point line is being layed out on foot, part of this distance is through Taft. N of this point truck tracks next to line off road within the 50' corridor.

1091 - N of this station driving along line off road staying within 50' corridor.

12 January 1997

Typing survey notes for the purpose of monitoring vibe trucks and GPL layout.

16 January 1997

Monitoring GPL deployment.

GPL 1088

1013 - Line being laid out on foot N and S of station.

1114 - Truck tracks on line off road within 50' corridor.

GPL 1096

1012 - Line being laid out on foot N and S of station.

1113 - Truck tracks off line down small wash next to road 150' off center line, no resources disturbed.

GPL 1104

1010 - Lay out on foot N of station. Truck tire tracks from

line down fence line 200' off center line to hole in fence, tracks go out to relay box and come back, no resources disturbed. Line being laid out on foot S of relay box.

1010 to 1117 - Mostly Taft between these stations.

1117 - Truck tracks on line off road within 50' corridor.

1120.5 - Line laid out on foot avoiding flagged resource at this station.

1127 - Line laid out on foot N and S of station.

1137 - Truck tracks on line off road within 50' corridor.

1139 - Truck tracks go to this station and stop, off road within 50' corridor.

1146.5 - Along line where dirt road crosses line, truck tracks go along line within 50' corridor, then back back down line back off the center line 40' in habitat right next to road to turn around and drive off line on road (diagram available in hand written notes).

1149 - Truck tracks on line off road within 50' corridor end at a wash and are laid out on foot N of station.

1156.5 - Road crosses line, source line meets GPL just N of road, source line is offset and hits road E of GPL. Truck tracks come off road onto GPL 35' off center line, truck tracks come down source line and go past point where the source line meets the road and turn off the line back toward the road 60' off the source line and not within the GPL corridor. No resources were disturbed in any of the tracks off 50' corridor (diagram available in hand writte notes).

Western Geophysical (Rusty Gentry) was informed of these new instances of driving off road and off the 50' corridor. He said he would talk to the crew again.

January 17, 1997

Went to AM meeting.

I went out with Krisite to observe and liarn monitoring vibes under wet conditions. Kristie recommended shuting down because of wet conditions at about 1000. There had been two border line lines, one line that was very bad and the next line was just worse than border line over most of the line. I learned a lot and thought it was a good call to recommend shuting down.

I went to look at the area where the vibe trucks were parked yesterday and a vibe truck was driven into habitat to test soil moisture conditions. I found tracks to indicate that a vibe truck was driven off road 25' into habitat 240' east of GPL 1080 near station 1094. I saw no vibe pad marks to indicate that any vibing was done. The truck did not leave any ruts, just tracks. The trucks were parked at this location all night. They were parked on the north and south side of a dirt road running east and west. On the north side of the road the trucks were parked on a birm, on the south side of the road the trucks were parked off the road in habitat, their tracks are 8' to 10' south of the road. On the north side of the road several vehicles, probably vibe trucks drove off the road to turn around and then drove in the opposite direction (west) in habitat. Turn around tracks were, at the most, 35' north of the road in habitat, tracks going in th opposite direction are 25' to 30' off the road in habitat. Several holes the right size to be San Joaquin antelope ground squirrel were run over, at least one hole appeared to be crushed by the truck tire (diagram is available in my hand written notes).

GPL Monitoring

GPL 1104

1237 - Line being laied out on foot north and south of this station.

GPL 1040 (Line being picked up)

1096 - Line being picked up on foot north and south of station.

1111 - Line being picked up on foot north and south of station, resource avoided, tracks on line made during vibing.

1140 - Line being picked up on foot north and south of station, oil field area.

1151 - Line being picked up on foot north and south of station, oil field area.

1181 - Line being picked up on foot north and south of station, oil field area.

1196 - Line being picked up on foot north and south of station, Fellows north of station.

1215 - Line being picked up on foot north and south of station, Fellows south of station.

1223 - Line being picked up on foot north and south of station, some tracks at road but can't tell if project related, on line within 50' corridor any way.

1236 - Line being picked up on foot north and south of station.

January 18, 1997

GPL 1048 (Line being picked up)

1056 - Line being picked up on foot north and south of station.

GPL 1112 (Line being laid out)

1066 - Line being layed out on foot north and south of station, flagged resource avoided.

1071 - Line being layed out on foot north and south of station.

1077 - Line being layed out on foot north and south of station.

1081 - Line being layed out on foot north and south of station.

1086 - Line being layed out on foot north and south of station, line in this area is disturbed with pipelines, road cuts, etc.

1092 - Line being layed out on foot north and south of station.

1095 to 1097 - Truck tracks 30' E of center line avoiding remains of an old structure, no resources affected. Line layed out on foot south of 1095.

1097 - Line layed out on foot north of station. Truck that left tracks on line between 1095 and 1097 came onto line and drove off line along and old road next to pipeline. The truck took a wide turn, probably driving off line, and ran over a small piece of habitat, no resources were affected. One burrow was crushed but it was too small to be PAGSB.

1108 - Line being layed out on foot south of station, a short distance of driving on line within the 50' corridor north of station but on foot beyond that.

Typed notes the rest of the day.

January 19, 1997

AM Meeting
Western Geophysical (Rusty Gentry) requested that I plot on a post plot map the resources found during biological surveys of GPLs from 1112 to 1200. I did this in the morning and early afternoon.

Monitoring

GPL 1112

1116 - Lay out crew comming down line by vehicles on roads, GPL being laid out on foot.

1130 - Leaving at this point to check out low end of line, vehicles, so far, have stayed on roads.

I was asked, by JB? I guess, to check recorder placement and cable lay out between the 1096 and 1104 line at the 1110 station. I checked and everything looked OK. Recorder placement was on the 1104 line within the 50' corridor, it was accessed on existing road, and the cable was laid out on foot.

GPL 1112

1170 - Vehicles driving off road on line within 50' corridor north and south of station, I led van down an old two track to get it back to an existing road.

1181 - Crew finished at this station for the day.

January 21, 1997

Monitoring - Surveying newly flagged drive around routes. Any resources found will be added to drive notes.

GPLs 1120 and over half of 1128 completed.

GPL 1104 (Line being laid out)

1120 - At midway highway, line was being laid out on foot, vehicles were using roads. The jug truck was on the south side of Midway highway at the end of a dirt road stopped on a birm between the end of the dirt road and the heghway. The jug truck drove over the birm to get to the highway. The birm was 120' off the center line and was covered with grass and salt bush. Western Geophysical (Rusty Gentry) was informed of this)

January 22, 1997

Monitoring - Surveying newly flagged drive around routes. Any resources found will be added to drive notes.

GPL 1128 - All new flagged routes but one completed.

Gay VerSteeg surveyed GPL 1144 and part of 1152.

GPL Lay Out Monitoring - Lines crossed on the way to 1128

GPL 1096

1217 - Truck travel off road on line within 50' corridor north and south of station, resource avoided.

GPL 1104

1211 - Truck travel off road on line within 50' corridor, north and south of station, resource avoided.

GPL 1112

1205 - Line laid out on foot south of station, truck travel off road on line within 50' corridor north of station.

GPL 1120

1162 - Line laid out on foot north and south of station.

1206 - Line laid out on foot north and south of station.

1209 - Line laid out on foot north and south of station.

January 23, 1997

Monitoring - Surveying newly flagged drive around routes. Any

resources found will be added to drive notes.

GPLs - One point on 1128, 1136, part of 1168

January 24, 1997

Monitoring - Surveying newly flagged drive around routes. Any resources found will be added to drive notes.

GPLs - The rest of 1152, part of 1160

January 25, 1997

Monitoring - Surveying newly flagged drive around routes. Any resources found will be added to drive notes.

GPLs - The rest of 1168, the rest of 1160, part of 1176.

January 26, 1997

Monitoring - Surveying newly flagged drive around routes. Any resources found will be added to drive notes.

GPL - The rest of 1176.

Typed notes the rest of the day.

January 27, 1997

GPL 1120

1128 - Line being laid out on foot N and S of station.

GPL 1128

1132 - Line being laid out on foot N and S of station.

Checked some of the new drive around notes, added to computer file and printed out 4 copies, one for Western Geophysical (Rusty Gentry).

January 29, 1997

Checking GPL Lay Out and doing some compliance monitoring.

GPL 1072

1082 - Line laid out on foot north and south of station.

GPL 1088

1098 - Line laid out on foot north and south of station, flagged resource avoided.

1107 - Jug truck drove around a thick clump of salt bush at station driving 50' W of line. Drive around had not been wurveyed. I looked at it and found no resources disturbed.

1126 - Jug trucks driving off li ne dwon wash to existing roads 100' E of li ne. More tracks come off or go onto a road in sash east of road. There is a lot of asphalt in the wash and it could have been mistaken for a road.

GPL 1096

1100 - Jug truck tracks off road along line within 50' corridor north and south of station.

Scouts for vibes were scouthin a route cross country to an offset point, they saw me in the area and asked me to survey their route. I surveyed and cleared it with no resources.

GPL 1104

1105 to 1106 - Plowed area, jug truck tracks come down line on the north side of the plowed area the tracks come off the 50' corridor and go west around the plowed area 165' off the 50' corridor, truck joins line on the south side of the plowed area.

GPL 1128

1132 to 1103.5 - Laid out on foot.

1103.5 to 1105 - Pick up truck tracks off road on line within the 50' corridor.

1073 - Jug truck tracks off road on line within 50' corridor to fence. At the fence the jug truck tracks turn west in habitat along the fence 90' off line to an existing road.

1074 to BOL - Laid out on foot.

30 January 1997

GPL 1136

1117 to 1118 - Jug truck tracks off road on line within 50' corridor.

1126 - Jug truck tracks off road on line within 50' corridor

1134 - Jug truck tracks off road on line within 50' corridor

1145 - Jug truck tracks off road on line within 50' corridor

1148 - Jug truck tracks off road on line within 50' corridor, flagged resources avoided.

1151 - Line being layed out on foot.

1154 - Line being layed out on foot.

1155 - Line being layed out on foot, flagged resources avoided.

1163 - Line being layed out on foot.

1171 - Line being layed out on foot.

1172 - Jug truck tracks off road on line within 50' corridor, 60' out from road and back.

1178 - Line being layed out on foot.

1186 - Just south of station, jug truck drove out of 50' corridor comming off an existing road and driving about 100' in unserveyed habitat. No resources were impacted.

1186 to 1191 - Jug truck driving off road on line within 50' corridor.

3 February 1997

GPL 1144

1000 (BOL) to 1218 - Line layed out on foot.

1218 to 1236 - Jug truck tracks off road on line within 50' corridor. Jug truck did not follow flagging around resources, staying along center line. Flagging around resources was mostly hidden by quickly growing grass. Drive notes included the drive around at these resources but obviously were not consulted before driving here. No burrows were driven over, all the flagged resource areas were avoided. Brought this up at early morning meeting on 4 Feb.

GPL 1128

1216 - Line layed on foot north of station, jug truck tracks off road on line within 50' corridor south of station.

GPL 1152

1221 - Jug truck tracks off road on line within 50' corridor north of station, line layed out on foot south of station.

1223 - Jug truck and van at station, line being layed out on foot at this point.

12 February 1997

While surveying source lines I found jug truck tracks on unsurveyed source line. 5171 5175 to 5170 5168 - Jug truck tracks along source line that has not been surveyed yet, tracks also outside 50' corridor (not drivers fault, line flagged poorly here). No resources impacted.

VIBE TRUCK MONITORING

30 January 1997

5165 5093 to 1096 1166 - Surveyed around vp and to GPL, also surveyed to road near vp and flagged route to road, no resources found.

5165 5109 - Surveyed to vp and flagged from GPL 1104 at 1165, surveyed turn

around area at vp. Surveyed line to SL south of vp. 25' from vp PBNLLB, 45' from vp PAGSB, offset vp 5' away from flagged area.

5173 5109 - No resources, vibe on road if possible. (vibed on road)

5178 5093 - PKFDs (old KFPDs) 75' andd 110' form vp, PAGSB near road, flagged route down road and to vp, surveyed turn around to west, if not turn around then vibes should back out, wash beyond vp.

2 February 1997

Vibe trucks moved off parking area at 0636 and were on line at 0645 starting at 5001 5112.

Vibing started at 0740.

5001 line - low impact.

5009 line - Resources (PErho) avoided and low impact to rest of line.

5017 line - Resources avoided, low impact ot rest of line.

5125 line - Resources avoided, two small hills near resources at 5117 were rutted up and the recorder was notified and asked to have repair crew fix rutts. Low impact over rest of line. PAGSB between 5112 and 5113 changed to PKFD and flags moved.

5033 line - low impact

5041 line - Pulled flags at 5119, hole occluded, spots at 5112 and 5113 rutted some, called recorder to report and ask for repair crew, low impact on rest of line.

5049 line - Mostly on roads, low impact.

5057 line - Rutted hillside at6 5113 and 5114 and between, called recorder for repair, rest of line mostly on roads.

5065 line - Mostly on roads.

5073 line - Vibed after dark, did not check for impact, told Kristy. PKFD at 5116, offset vp 50 west and stacked at 5117, drove by den on road 18' from den and stacked at 5116.

5081 line - Last line cleared.

APPENDIX D

BUREAU OF LAND MANAGEMENT

NOTICE TO PROCEED LETTER

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Caliente Resource Area
3801 Pegasus Avenue
Bakersfield, California 93308

3151 (CA-36964)
CA016.88

NOV 15 1996

John A. Beery, Senior Geologist
Chevron USA, Incorporated
P.O. Box 1392
Bakersfield, California 93302

Dear Mr. Beery:

A review of your "Notice of Intent to Conduct Geophysical Operations" which includes public land in T30S, R22E, Sec 36; T30S, R23E, Secs 31-32; T31S, R22E, Secs 1, 12-14,23-26, 35-36; T31S, R23E Secs 3-11, 14-23, 26-36; T32S, R23E, Secs 1-2; T32S, R23E, Secs 1-17, 21-25; and T32S, R24E, Secs 5-8, 17-18, MDB&M, near Taft, Kern County has been completed. Your proposal is approved, subject to the following practices and mitigation measures that must be followed in conducting your operations:

A. Chevron USA, Incorporated and Santa Fe Energy and their operators will adhere to the terms and conditions and reporting requirements contained in U.S. Fish and Wildlife Service Section 7 Biological Consultation 1-1-96-F-120 dated November 12, 1996

B. All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications.

C. Vibroseis avoidance criteria for off-road locations:

- 200 feet from occupied San Joaquin kit fox natal dens;
- 150 feet from known San Joaquin kit fox natal dens;
- 100 feet from occupied San Joaquin kit fox dens;
- 100 feet from known San Joaquin kit fox dens;
- 50 feet from potential San Joaquin kit fox dens;
- 50 feet from giant kangaroo rat burrow systems;
- 30 feet from burrows where San Joaquin antelope squirrel burrows;

- 30 feet from occupied blunt-nosed leopard lizard burrows;
- 30 feet from badger dens;
- 30 feet from burrowing owl burrows;

D. Access route avoidance criterion for off-road vehicle travel:

1. No sensitive wildlife resources shall be located within a 50-foot corridor along access routes and receiver lines.

E. The seismic contractor shall test soil conditions to determine when vehicles can commence activity after the area receives measurable rainfall. The result of soil compaction is a decrease in volume. This decrease can be quantified by measuring the depth of the depression left by the compacting instrument. During the first day of seismic testing, with soil in a dry condition, the project biologist will measure the depth of tire tracks and all vibroseis pad depressions at 20 source points. After measurable rainfall, when surface soils are no longer in a saturated condition, the biologist will measure tire and all vibrator pad depressions at the first source point of the day. If depth measurements of tire tracks and vibroseis pad depressions are more than 75% greater than average measurement taken in dry soil, all off-road vehicle travel will be suspended until conditions improve.

F. Geophones will be placed on BLM and DOE lands in the following manner:

1. All vehicles will avoid driving on areas of cryptogamic soils.

2. The geophones will be walked across cryptogamic soils and areas identified as having high densities of listed plants and deployed by hand in the field.

3. If necessary, biological monitors will be on-site during geophone placement to identify sensitive areas to avoid.

4. Selected geophone lines may be marked on BLM lands to provide line location for post-project monitoring.

G. All source points in areas, on BLM lands, that are found to have high densities of listed plants will be relocated.

H. No off-road vehicle travel (except by ATVs) in areas found to have any densities of listed plants. Vibrator trucks will follow flagged routes around areas of listed plants on BLM lands. A 50 foot avoidance zone for Hoover's wooly star will be enforced.

I. To minimize the potential for incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat the following reasonable and prudent measures are required.

1. The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats shall be minimized.

2. The potential for inadvertent entrapment of San Joaquin kit foxes, blunt-nosed leopard lizards and giant kangaroo rats in dens and burrows shall be minimized.

3. The extent of off-road survey routes and other seismic testing areas shall be minimized.

4. The potential for unauthorized vehicle use of off-road survey routes shall be minimized.

J. The seismic contractor shall provide compliance with the following terms and conditions, which implement the reasonable and prudent measures described above:

1. The potential for harm or mortality to listed wildlife species and their habitats shall be minimized by implementing the following procedures:

a) All measures as proposed by USFWS (1996) for the Chevron/Santa Fe Midway Valley 3D seismic project shall be followed. Mitigation measures presented below incorporate such requirements of the proposed Midway Valley 3D seismic project.

b) Prior to the onset of ground-disturbing project activities, a qualified wildlife biologist shall provide an employee orientation program to project personnel on the occurrence and distribution of listed species in the project area, measures being implemented to protect these species during project actions, reporting requirements shall incidental take occur, and applicable definitions and prohibitions under the Endangered species Act of 1969 Act.

c) Within 4 weeks prior to commencement of seismic testing activities, a qualified biologist(s) shall conduct preactivity surveys of proposed vibrator and geophone travel paths. During pre-activity surveys, the status of previous surveys shall be reviewed. San Joaquin kit fox dens and kangaroo rat and leopard lizard burrows shall be flagged for avoidance, as necessary, and additional habitat features, if any, shall be identified and flagged as necessary.

d) Qualified biologists shall accompany seismic survey vehicles and crews throughout the project area at all times that activities with the potential to affect listed species are being conducted. Qualified biologists may conduct preactivity surveys as described above; should aid seismic crews in satisfying avoidance criteria and implementing project mitigation as described in this evaluation; should aid seismic crews in relocating shot and geophone lines as necessary; should observe and note all pertinent information concerning project effects on listed species; and in general should assist the seismic contractor in conducting the proposed project in such a manner as to minimize adverse effects on endangered and threatened species. At least one qualified biologist shall accompany the vibrator crew working within endangered species habitat.

e) Pets shall not be permitted on the project site during project activities.

f) All food-related trash such as wrappers, cans, bottles, and food scraps shall be

disposed of in closed containers only and regularly removed from the project site.

g) All spills of hazardous materials within endangered species habitats shall be cleaned up immediately per Chevron's or other land owner's SPCC plans.

h) Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset.

i) All project-related vehicles shall observe a speed limit of 20 mph or less on all routes that traverse endangered species habitat, except on State and County highways and roads.

j) Within 45 calendar days after completion of the project, the seismic contractor shall submit to the Service, the BLM, DOE and NPRC a post-activity compliance report that details the following information: dates that seismic testing occurred; pertinent data concerning the seismic contractor's success in meeting project mitigation measures, if any; known project effects on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats, if any (including specific number of dens and small mammal burrows damaged or destroyed); occurrences of incidental take of federally listed species, if any; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats, a summary of rehabilitation plans, if any; and other pertinent information.

2. All known and potential San Joaquin kit foxes dens, giant kangaroo rat burrows, and burrows potentially inhabited by blunt-nosed leopard lizards shall be protected by implementing the following procedures. Such protection will help prevent incidental take of dens and burrows in excess of the take limits described above.

a) All project vehicles shall observe travel avoidance routes describe in the biological preactivity survey notes that provide avoidance for sensitive wildlife and special status plant resources, unless alterations to these routes are expressly allowed by the biological monitors.

b) To minimize effects of geophone deployment, the applicant shall utilize approved travel corridors along geophone lines to deploy all off-road geophone lines that occur within endangered species habitat. No vehicles other than geophone deployment vehicles shall be used to deploy geophones in such areas. During geophone deployment, work crews shall make every reasonable effort to avoid sensitive habitat areas such as dens, burrows, and cryptogamic crusts. To the maximum extent practicable, geophone vehicle operators shall avoid such habitat areas by 10 feet. One biologist exclusive of biologists observing vibrator crew activities shall oversee the activities of geophone line deployment crews.

c) All avoidable San Joaquin kit fox dens and kangaroo rat and blunt-nosed leopard lizard burrows within the immediate vicinity of survey routes shall be prominently staked and/or flagged as necessary to alert project personnel to their presence. All

project-related flagging shall be collected and removed after completion of the project.

d) The applicant shall make every reasonable effort to prevent the collapse of dens and burrows by relocating source points to avoid dens and burrows or other means as determined to be appropriate.

e) Project biologists shall keep an accurate and running tally of the number of dens and burrows damages, destroyed, or otherwise affected by project activities. Such tallies shall be combined and totaled at the end of each work day to determine proximity to take limits and the need for subsequent project modifications to prevent den and burrow effects in excess of take limits. Total number of dens and burrows affected by the project shall be reported in the post-activity compliance report.

f) If damage or destruction to a known San Joaquin kit fox den cannot be avoided during project activities, the BLM, DOE, and USFWS shall be contacted immediately for guidance. Potential kit fox dens that cannot be avoided during project activities may be excavated and backfilled pursuant to Service guidelines without prior notification, provided that excavation is approved and supervised by a project biologist and that such excavation is within incidental take limits provided in the projects biological opinion. Destruction of all kit fox dens shall be reported in the post-activity compliance report.

3. The extent of off-road survey routes and other seismic testing areas shall be minimized by implementing the following procedures:

a) Where seismic lines cross threatened or endangered species habitat, the survey corridor within which testing and ancillary vehicles operate shall be limited to a maximum width of 50 feet (25 feet on either side of the center line). These testing activity zones shall be reduced, where possible, to avoid endangered species sites such as occupied kit fox dens or kangaroo rat burrows.

b) Project related vehicles shall be confined to existing primary or secondary roads or to specifically delineated project areas (i.e., areas that have been surveyed and described in existing documentation). Otherwise, no off-road vehicle travel shall be permitted.

c) Unauthorized vehicle use of off-road survey routes shall be minimized by implementing appropriate measures to prevent unauthorized entry to off-road survey routes, including placement of gates or fences where these routes intersect existing roads, and posting of signs stating that access is not permitted.

K. The following general and specific measures shall be implemented to avoid potential adverse impacts to candidate and California species of special concern and their habitats:

San Joaquin Antelope Squirrel - Impacts can be avoided by staying to the flagged route and avoiding the burrows as marked in the field. In addition, a biologist is recommended to assist project related vibroseis and geophone truck cross country travel so as avoid sensitive

resources (burrows) and their habitat(s).

Blunt-nosed leopard lizard - The project area is within the known range of blunt-nosed leopard lizards. Project impacts to blunt-nosed leopard lizard habitat could result from habitat being temporarily destroyed (crushed shrubs and vegetation that serve as loafing cover). This type of impact may be lessened by having a flagged route that vehicles shall follow through areas of low density shrubs and other vegetation. Shrubs and burrows shall be avoided to reduce impacts to over-wintering blunt-nosed leopard lizards.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November-February). Project activities will be conducted during daylight hours when lizard activity is optimum. Impacts to this species could result from lizards being crushed by vehicle traffic. In addition, vibration induced collapse of burrows is a low impact potential if avoidance criteria are complied with. Blunt-nosed leopard lizard impacts will be minimized using the following measures:

1. Check surrounding land uses and disturbance for suitable leopard lizard habitat, and
2. Check percent slope, and
3. Check vegetation density, and
4. Check availability of burrows for refuge

Loggerhead Shrike - Loss of foraging and nesting habitat for the Shrike may result if large shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Le Conte's Thrasher - Loss of potential foraging and nesting habitat for Le Conte's thrashers may result if shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Burrowing Owl - Loss of foraging and nesting habitat for burrowing owls may result as the seismic travel corridor is being used. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Short-eared Owl - This species can fly out of imminent danger, though nesting areas remain vulnerable to seismic travel corridors. Preactivity surveys shall include a thorough inspection of the proposed seismic travel corridor and proposed access travel paths to ensure that nests of this species are not destroyed. Young owls are especially vulnerable to collisions with vehicles, particularly during foraging bouts. Increased disturbance and mortality would lower breeding success, and may cause the owls to abandon the site. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites. The recommended mitigation measures should greatly reduce the potential for impacts to short-eared owls within the project area.

L. Vegetation and Habitat Types

1. Project related vehicles shall be restricted to approved travel routes and paths/roads. Large shrubs shall be avoided in an effort to minimize impact to wildlife habitat. Large shrubs shall be avoided by carefully selecting travel paths/roads to avoid crushing individuals. In addition, washes represent a fragile habitat type and function as seasonally productive sources of annual vegetation for animals, as dispersal corridors, and as areas affording favorable burrow construction habitat. Washes shall be avoided by all vehicular activity as feasible.

2. If during any phase of the seismic operation any oil or other pollutant shall be discharged from project related vehicles, or from containers impacting Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of holder to control, cleanup or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

O. Cultural Resources

1. Prior to initiation of field work, all field supervisors and personnel shall be briefed by an archaeologist or cultural specialist about the general cultural background for the region and the sensitivity of cultural resources in the project vicinity. The archaeologist shall inform project personnel to avoid flagged areas, not to collect or disturb artifacts, and to report any late discovery of cultural resources in the project vicinity to the archaeologist.

2. Once land surveyors pin flag the center line of the geophone and source lines, an intensive cultural inventory on all seismic corridors will be conducted in advance of land disturbing activities; e.g., vibroseis trucks, cross country vehicles.

3. All cultural sites will be flagged for avoidance including a safe buffer zone to prevent any disturbance to them and monitored for compliance by an archaeologist. Once seismic activities in the area cease, flagging will be removed.

4. Archaeologist shall be present during all potentially damaging project activities that are near cultural resources unless flagging alone is determined sufficient for avoidance. The project archaeologist shall assist field personnel in avoiding disturbance to cultural sites.

5. Should any disturbance occur to cultural resources during the project, it shall be immediately reported to the BLM/DOE authorized staff. All work in the immediate area of disturbance shall cease until approval to proceed is given by the BLM/DOE authorized officers, subsequent to completion of cultural compliance.

6. The archaeological contractor will provide at a minimum a weekly status report to BLM/DOE on project progress or more frequently should problems arise. The report will at a minimum include the number of miles surveyed, number of sites discovered and recorded or updated, areas where vibroseis activities have been completed, the number of sites flagged for avoidance, and the results of monitoring activities.

7. After completion of the project, a complete archaeological report prepared by the archaeological contractor with the results of the cultural investigation, the number of sites avoided, and assessment of monitoring activities will be provided to the SHPO, with copies to BLM and DOE.

If you have any questions regarding these stipulations, please contact Steve Larson. For all other questions, please contact Russ Lewis. Both Russ and Steve can be reached at (805) 391-6000.

Sincerely,

Stephen Larson

for James Wesley Abbott
Area Manager

APPENDIX E

ENVIRONMENTAL ASSESSMENT

AND

U.S. FISH AND WILDLIFE SERVICE BIOLOGICAL OPINION

These documents describe the project location and contain detailed descriptions of seismic techniques and design used. Incidental take allowed and agency required mitigation for sensitive wildlife and special status plant species are found in both documents.

BLM EA # CA-016-97-009
BLM R/W SERIAL N. CACA 36964
DOE/EA - 1188

JOINT ENVIRONMENTAL ASSESSMENT FOR CHEVRON U.S.A., INC. AND SANTA FE ENERGY RESOURCES, INC.

MIDWAY VALLEY 3D SEISMIC PROJECT, KERN COUNTY, CALIFORNIA

OCTOBER 1996

U.S. DEPARTMENT OF ENERGY
NAVAL PETROLEUM RESERVES IN CALIFORNIA

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
CALIENTE RESOURCE AREA

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INTRODUCTION

The proposed Midway Valley 3D Geophysical Exploration Project covers approximately 31,444 acres of private lands, 6,880 acres of Department of Energy Lands (DOE) within National Petroleum Reserve 2 (NPR2) and 3,840 acres of lands administered by the Bureau of Land Management (BLM), in western Kern County, California. A Biological Opinion for the proposed project has been rendered by the Acting Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, Sacramento Field Office in Formal Section 7 Consultation with the Area Manager, Caliente Resource Area, U.S. Bureau of Land Management, Bakersfield, CA.

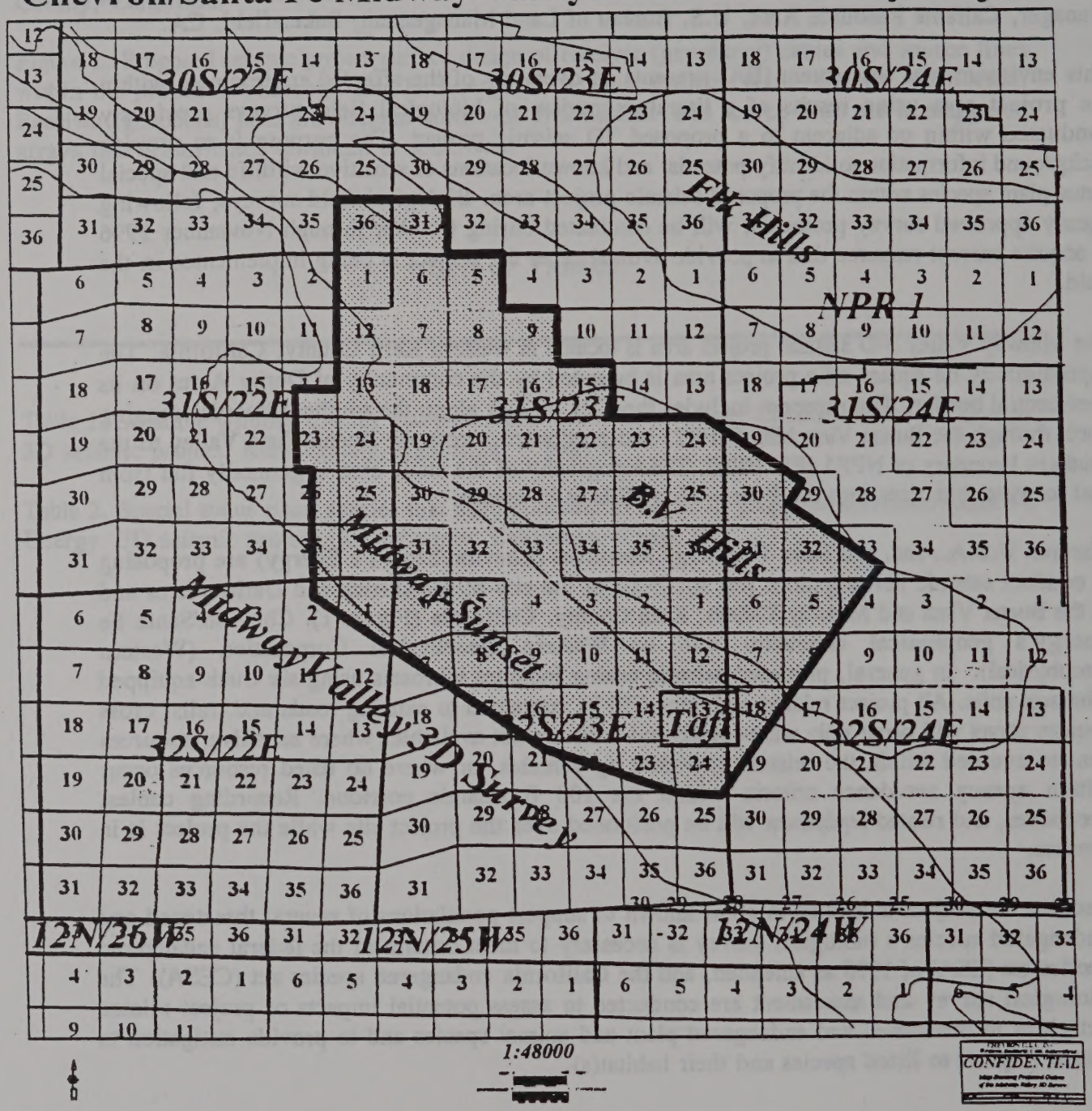
This environmental assessment (EA) presents an overview of the affected environment within the project area using results of a literature review of biological field surveys previously conducted within or adjacent to a proposed 3D seismic project. The purpose is to provide background information to identify potential and known locations of sensitive wildlife and special status plant species within the proposed seismic project area. Biological field surveys, following agency approved survey protocols, will be conducted during October through November 1996 to acquire current resource data to provide avoidance as the project is being implemented in the field.

The Midway Valley 3-D seismic project area is located in western Kern County, California. The approximately 66 square mile project area is bounded by the community of Derby Acres on its west-central border. The prospect includes the City of Taft along the southern boarder ranging north through the Buena Vista hills (NPR2) and northward across the Buena Vista Valley to the southern boundary of NPR1 (Elk Hills). The topography of the study area is generally flat from east to west, but rises into the Buena Vista Hills at its center.

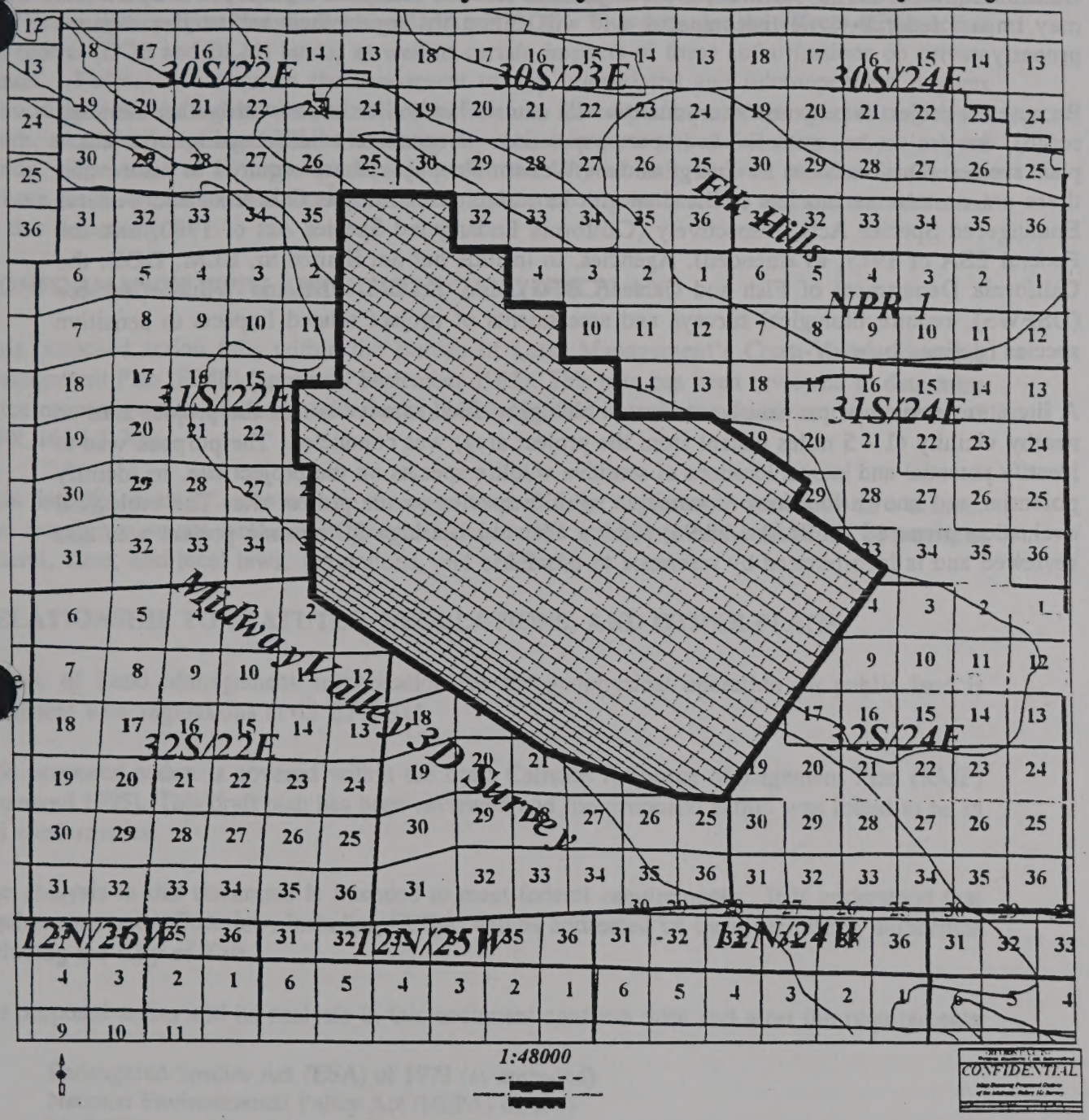
Chevron U.S.A., Inc. and Santa Fe Energy Resources (Chevron/Santa Fe Energy) are proposing to conduct seismic investigations just southeast of the city of McKittrick and Derby Acres and in the Buena Vista and Midway Valleys, Kern County, California (Figure 1). Chevron/Santa Fe Energy's geophysical contractor will be Western Geophysical Corporation (Western Geophysical). In general, proposed seismic testing includes vibroseis using six truck equipped vibroseis units. All project related activities will be contained to existing roads and trails; cross country travel will occur only where roads and trails are not available, where sensitive resources can be avoided within the seismic corridors by vehicles, or where no listed resources occur within agency avoidance criteria within the 100 ft seismic corridor. Recording cables, geophones, and related equipment will be positioned over the project site while the project is in process.

Because the project is located in areas known to support populations of several threatened and endangered species a biological survey is necessary to meet criteria of the federal endangered species act (ESA) of 1976 as amended, and the California endangered species act (CESA). The biological survey and assessment are conducted to assess potential impacts of project related activities to threatened and endangered plant and animal species and to provide mitigation to lessen impacts to listed species and their habitat(s).

Chevron/Santa Fe Midway Valley 3D Seismic Survey Project



Chevron/Santa Fe Midway Valley 3D Seismic Survey Project



Receiver line orientation

Source line orientation

The proposed geophysical operation directly and indirectly will affect private and BLM and DOE land holdings. The proposed geophysical operation has the potential to adversely affect environmentally sensitive resources as defined in DOE's NEPA Implementing Procedures and Guidelines (57 FR 15122, April 24, 1992, codified in 10 CFR 1021). The geophysical operation may impact federally/state listed species and will minimally impact their habitat if mitigated properly.

Because the project is proposed to cross areas with natural lands (i.e., areas with valley saltbush scrub), the project has potential to impact populations of sensitive wildlife and special status plant species. Chevron/Santa Fe Energy and the Western Geophysical are required to insure that there are no adverse impacts to listed species in compliance with the California and Federal Endangered Species Acts, respectively (California Endangered Species Act of 1980, and the Federal ESA of 1973, as amended). Agencies, to include but not limited to, BLM, DOE, the California Department of Fish and Game (CDFG), and the U.S. Fish and Wildlife Service (USFWS), require biological surveys and assessments of project related impacts to sensitive species (defined below).

A literature review of previously conducted biological filed surveys within the project area or nearby vicinity (1 - 5 miles distant from the project area) was conducted. The purpose was to identify potential and known locations of sensitive wildlife species on the project site. to identify potential and known locations of sensitive wildlife species on the project site. The biological evaluation prepared by BLM (7/8/96) for the Chevron Belridge 3D seismic project was also reviewed and is incorporated by reference to this EA.

SCOPE

This environmental assessment addresses impacts resulting from seismic survey activities that [illegible]l occur if the project is authorized by BLM and DOE. This includes the effects of the action [illegible] federal (DOE and BLM) lands, as well as certain impacts of these authorizations on private lands. Federal law requires the assessment of any interrelated and interdependent impacts (resulting from the federal authorization) to federally listed plant or animal species on private lands, as well as resulting dependent or integrally related impacts to cultural resources on private lands. The issue of all impacts to lands within the City of Taft, as well as other impacts to private lands, are deferred to local government and permitting authorities, and are not addressed in this document.

CONFORMANCE WITH APPLICABLE LAND USE PLAN

This proposed action falls within the Bureau of Land Management's Coast-Valley Resource Management Plan (RMP) (approved September 1985). This plan has been reviewed to determine if the proposed action conforms with the land use plan, terms, and conditions as required by 43 CFR 1610.5-3(a).

This decision states"...areas will be managed to encourage exploration operations in a manner that recognizes sound reclamation practices, within the guidelines and constraints of pertinent federal, state, and local laws, regulations, and orders."

RELATIONSHIP TO STATUTES, REGULATIONS, AND OTHER PLANS:

[illegible]eau of Land Management authorization for the geophysical operation on public land is [illegible]sistent with regulations at 43 CFR 315.

This proposed action is covered within the draft Caliente Resource Management Plan (RMP) (approved 1995). This draft plan has been reviewed and the proposed action was found to be in full conformance.

The analysis in this document is intended to meet federal requirements. It is understood that requirements under State law, including CEQA, will be addressed by local permitting authorities including the City of Taft.

The proposed action and its analysis in this document conform with and meet the requirements of:

Endangered Species Act (ESA) of 1973 (as amended)
National Environmental Policy Act (NEPA) of 1969
43 CFR Part 3150
National Historic Preservation Act of 1966, amended 1992
36 Code of Federal Regulations, Part 800
Programmatic Agreement between Bureau of Land Management, the California State Historic Preservation Officer, and the Advisory Council of Historic Preservation (June 3, 1991).

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

Chevron/Santa Fe Energy have proposed to conduct seismic investigations to obtain information about potential oil and gas deposits in the Midway Valley Area.

The proposed action requires the authorization from BLM and DOE for portions of the geophysical operation on federal lands (3,840 acres of BLM lands and 6,880 acres of DOE lands located within NPR2). Permits for land use and geophysical operation crossing were obtained by the seismic contractor for Chevron/Santa Fe prior to project related field operations.

Given that Chevron and Santa Fe are two of the largest oil field operators and land holders in the Midway Valley area, their joint approach to evaluation of acreage with 3D seismic data likely will result in a reduction in the number of future, separate, geophysical operations in the area. Hence, long-term impacts to listed species and their habitat will be minimized.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 NO-ACTION

Under the no-action alternative, the BLM and DOE would not allow seismic operations to be conducted on BLM and DOE lands. Therefore the seismic project area would be reduced in mineral and surface data acquisition and only involve private lands.

2.2 PROPOSED ACTION

The project is proposed in three stages. Phase 1 will consist of five to six 2-man survey teams deploying temporary pin flags along the source and receiver lines. Agency approved biologists and archaeologists will follow the surveyors and flag all areas where surface disturbing activities may affect listed wildlife and cultural resources. The biologists and archaeologists will recommend re-routes so that project vehicles can adhere to agency approved avoidance criteria for sensitive, or listed biological and cultural resources.

Phase 2 will consist of placement of geophones and data collection. The proposed project includes 34 lines of geophone and associated receiving cable, totaling 295 miles, and 52 source lines totaling 263 miles. Each source line segment will contain 8 shot points spaced 165 feet apart (1,320 feet per source line). Light-weight, four- wheel, all-terrain vehicles (ATVs) and four-wheel drive trucks will be used to transport, deploy, and pick up the recording equipment. Geophone trucks will be used for geophone deployment and retrieval. This action is proposed along the same geophone lines that the vibrator trucks will follow. ATVs will be used for all additional travel to service and repair recording equipment at all off-road locations. In some cases, deployment of recording equipment would be completed by hand. Six truck mounted vibroseis units spaced 2-5 ft apart will proceed in single file along source lines generating seismic energy near the 8,426 source points. The lead vibrator truck will stop one truck length past the source point, all trucks will lower their pads and vibrate for 18 seconds before moving

forward approximately 7.5 ft to repeat the process. Each truck will lower its pad and vibrate 12 times at each source point. The collective vibrator pad depression at each source point has the potential to be 0-6 inches deep, 7 ft wide, and 165 ft long. After completing vibroseis at all eight points along a source line segment, vibrator trucks will travel on the perpendicular geophone line for 1320 ft to reach the next set of eight source points and begin vibrating. The pads on the units are 7.25 ft. wide and 3.0 ft. long. All project vehicles, excluding vibrator trucks and vehicles deploying geophones, will be confined to existing roads except where practical. Phase 1 and Phase 2 would require a total of approximately 120 days to complete. The project is scheduled to begin in November of 1996 and should be completed by late February 1997.

Phase 3, project reclamation, will proceed concurrently with the completion of Phase 2 activities. All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications. BLM and DOE standard mitigation measures shall apply and are included as Appendix A. Phase III will be completed thirty days after conclusion of project.

2.3 ALTERNATIVES ELIMINATED FROM CONSIDERATION

Alternative locations to the proposed geophysical operation were considered during initial site selection. Such alternatives would require a request for larger surface area or a different seismic testing approach (large drilling trucks) thereby creating equal or greater potential impacts to endangered species habitat and cultural resources. The proponents decided not to pursue these options; further analysis was therefore dropped.

Chevron/Santa Fe could confine the project scope to private lands. Under this alternative, Chevron would be required to obtain a Section 10a permit from the U.S. Fish and Wildlife Service as required by the Endangered Species Act of 1973, as amended. Impacts from the private lands alternative would be much the same as those for the proposed project except that they would not involve public land.

3.0 AFFECTED ENVIRONMENT

3.1 PROPOSED ACTION

3.1.1 AIR QUALITY

Air quality in the Kern County region is considered marginal, with the San Joaquin Valley Air Basin being designated as a non-attainment area for two of the six criteria air pollutants (ozone and PM-10 [particulate matter less than 10 microns]) for which National Ambient Air Quality Standards (NAAQS) have been established. All activities are governed by an extensive air pollutant permitting and monitoring program operated by the San Joaquin Valley Unified Air Pollution Control District.

3.1.2 WATER RESOURCES

All surface water in the region can be characterized as dry wash run off from sparse rainfall in an arid environment. Total annual rainfall is approximately five to six inches per year, with about 70 percent of that occurring from December through March. Groundwater quality in the Buena Vista and Midway Valley areas varies considerably, with Total Dissolved Solids (TDS) levels ranging from 50 parts per million (ppm) in perched groundwater to over 2-3,000 ppm in certain unconfined aquifers. DOE/BLM EA-1124, May 1996 3D Seismic.

3.1.3 GEOLOGY AND SOILS

The site is currently characterized by relatively flat areas to rough rolling hills with numerous small drainages. The proposed project is occupied by the Lower Sonoran Grassland community (Twisselmann, 1967) and Valley saltbush scrub and non-native grassland habitats (Holland 1986) and is naturally subject to wind and water erosion. Areas directly impacted by the proposed action would be reclaimed and revegetated after completion of geophysical operations.

3.1.4 LAND USE

NPR-2 consists of approximately 38,000 acres and has been extensively used for petroleum extraction and processing since the early 1900's. Oil production, gathering, and processing currently are the predominant land uses within the boundaries of the site. It is anticipated that NPR-2 lands will be used for petroleum extraction and processing for several decades. Land uses in the area surrounding NPR-2 follow the general patterns found throughout Kern County, which are dominated by agriculture, livestock grazing, and oil and gas extraction and production. Surface and mineral rights on lands surrounding the site are owned primarily by major oil companies.

3.1.5 WASTE MANAGEMENT

Bureau of Land Management policy requires all hazardous wastes be removed from the site, should there be any, in accordance with all federal, state and local laws and regulations by a state certified hazardous waste transporter to a state permitted hazardous waste disposal/recycling facility. Solid sanitary wastes will be collected in bins and transported to the local municipal landfill.

3.1.6 BIOLOGICAL RESOURCES

For the purpose of this environmental assessment, the term "sensitive wildlife species" refers to taxa that are on the CDFG Special Animals List (CDFG 1994) in any of the following categories:

1) Federal Threatened and Endangered Species (USFWS 1989) that are protected by the Endangered Species Act (ESA 1973) as amended.

2) Federal candidate species (USFWS 1996) that are under review for listing as Endangered or Threatened. Although federal candidate species receive no statutory protection under ESA (1973), USFWS encourages federal agencies to take such taxa into account in environmental planning.

3) California State Threatened and Endangered Species (CDFG 1992), and California species of special concern (Remsen 1978, Williams 1986).

Sensitive wildlife species that potentially occur within and adjacent to the project area were identified (Table 1). Other sensitive wildlife species that may use the project site on an infrequent basis, i.e., during migration, are not included in this list.

Sensitive wildlife species and their sign (tracks, scats, etc.) that have been recorded within and adjacent to the project area and include: Blunt-nosed leopard lizards (*Gambelia silus* - sightings, tracks, scats and burrows), San Joaquin kit fox (*Vulpes vulpes macrotis* - telemetry study, mortalities, den surveys, tracks, scat, sightings, active dens), San Joaquin antelope squirrels (*Ammospermophilus nelsoni* - sightings, tracks, scats, and burrows), giant kangaroo rats (*Dipodomys ingens* - surveys, sightings, precincts, mortalities), short-nosed kangaroo rats (*Dipodomys nitratoides brevinasus* - trapped individuals, mortalities along roads, tracks, scats, and burrows), burrowing owl (*Athene cunicularia* - sightings, droppings, castings, burrows), loggerhead shrike (*Lanius ludovicianus* - sightings and nests), Le Conte's Thrasher (*Toxostoma lecontei* - sightings and nests) and short-eared owls (*Asio flammeus* - sightings).

Special status plants include species listed as threatened or endangered by the state of California or federal government and those species listed as List 1B plants by California Native Plant Society (CNPS) (Smith and Berg 1988). Table 2 presents special status plant species that have potential to occur at the project site. One listed special status plant species known to occur at the project site (additional CNPS plant species are presented in Table 2): Hoover's Woolly-star (*Eriastrum hooveri*). Vegetation of the area is predominantly a sparse cover of red brome (*Bromus rubens*) and red-stemmed filaree (*Erodium cicutarium*). Saltbush (*Atriplex polycarpa*) is present along slopes and in washes and drainages in hillier areas. Cheesebush (*Hymenoclea salsola*) is the most abundant shrub in washes and flat sandy areas on the lower slopes. Other relatively common shrubs include bladderpod (*Isomeris arborea*) and matchweed (*Gutierrezia bracteata*).

Table 1. Sensitive wildlife species potentially occurring within the Chevron/Santa Fe Energy Company 3D Seismic Project, Kern County, California.

	STATUS	
	STATE[1]	FEDERAL[2]
REPTILES		
Blunt-nosed leopard lizard (*Gambelia silus*)	SE	FE
BIRDS		
Burrowing owl (*Athene cunicularia*)	CSC	-
Le Conte's thrasher (*Toxostoma lecontei*)	CSC	-
Loggerhead shrike (*Lanius ludovicianus*)	CSC	-
MAMMALS		
San Joaquin antelope squirrel (*Ammospermophilus nelsoni*)	ST	-
Giant kangaroo rat (*Dipodomys ingens*)	SE	FE
Short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*)	CSC	-
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	CSC	-
San Joaquin kit fox (*Vulpes velox macrotis*)	ST	FE
American badger (*Taxidea taxus*)	CSC	-

[1] SE Listed as Endangered by the State of California
ST Listed as Threatened by the State of California
CSC California Department of Fish and Game "Species of Special Concern"

[2] FE Listed as Endangered by the Federal Government

Table 2. Status, distribution, and habitat of special status plant species with potential to occur within the Chevron/Santa Fe Energy Company 3D Seismic Project, Kern County, California.

Species[1] Common Name[2]	USFWS Listing[3]	State Status[4]	CNPS Status[2]	Habitat Type[5]	Distribution by County[2]
Atriplex vallicola Lost Hills saltmat	None	None	2-2-3 List 1B	clay slicks	FRE KRN SLO
Caulanthus californicus California jewelflower	Endangered	Endangered	3-3-3 List 1B	sandy grassland	FRE KNG * KRN SBA SLO TUL*
Delphinium gypsophilum ssp. *gypsophilum* gypsum larkspur	None	None	1-1-3 List 4	gypsum rich grassland soils	ALA CCA FRE KNG KRN MAD MER SJQ STA
Delphinium recurvatum recurved larkspur	None	None	1-2-3 List 1B	saltbush scrub, grassland	CCA COL FRE KNG KRN MER SLO SOL TUL
Eriastrum hooveri [6] Hoover's woolly-star	Threatened	None	1-2-3 List 1B	sandy saltbush scrub	FRE KRN SLO SBA
Eriastrum pluriflorum ssp. *sherman-hoyteae* small-stamen woollystar	None	None	1-1-3 List 4	sandy grassland	LAX KRN
Eriogonum gossypinum cottony buckwheat	None	None	1-2-3 List 4	barren clay-sandstone	FRE KNG KRN SLO
gonum temblorense Temblor buckwheat	None	None	1-1-3 List 4	barren clay-sandstone	KRN MNT SLO
Hemizonia pallida Kern tarplant	None	None	1-2-3 List 4	sparse grassland	KRN KNG
Hollisteria lanata hollisteria	None	None	1-2-3 List 4	saltbush scrub grassland	FRE KRN MER MNT SBA SLO
Lembertia congdonii San Joaquin woolly-threads	Endangered	None	3-2-3 List 1B	sandy grassland scrub	FRE* KNG KRN SBA SBT SLO TUL*
Nemacladus gracilis slender nemacladus	None	None	1-1-3 List 4	grassland	FRE KNG KRN MER
Trichostema ovatum San Joaquin blue-curls	None	None	1-2-3 List 4	grassland	FRE KNG KRN TUL

Notes:
1. Nomenclature corresponds to Kartesz and Kartesz (1980) with the exception of *Lembertia* (*Eatonella*) *congdonii* (Gray) Greene.
2. Smith and Berg (1988); counties abbreviated by a three letter code. Some county records are based on recent, unpublished information.
3. No federal candidate plant species are known to have distributions within the project area.
4. Section 1904, California Fish and Game Code (January 1989 listing) (CDFG 1989).
5. Twisselmann (1956, 1967), Munz and Keck (1968), Taylor and Davilla (1986), Smith and Berg (1988) Taylor (1987) and field observations.
6 This is the only listed plant species currently known to exist in the proposed project area.

* Presumed extinct in this county.

3.1.7 SOCIOECONOMIC IMPACTS

Short-term subcontractors will be used to perform the project management, cultural resource surveys, geophysical field work, and interruption of the seismic data, which will provide an incremental economic benefit to the local economy.

The seismic operation would require two crews consisting of a recording/geophone cable lay-out crew made up of 25-30 workers at peak lay-out operations and a vibroseis crew consisting of six trucks and one mechanic's support truck (7 persons). The operation is temporary and once the data acquisition is completed no permanent jobs will be added. The proposed action would not increase the local population permanently, or have an adverse impact on housing, public services, or local infrastructure. The local economy would realize a short term, positive impact from expenditures for locally available services, equipment, and supplies.

3.1.8 CULTURAL RESOURCES

European contact in the San Joaquin Valley was first recorded in 1772 when Spanish soldiers traveled through Tejon Pass into the valley. A few years later in 1776 Francisco Garces arrived in the area. Later attempts by the Catholic church to establish missions in the area failed. In the middle to latter part of the 1800s there was significant development of agriculture in the valley. In addition, exploitation of the petroleum industry in the San Joaquin Valley was underway as early as the 1864. To present day both the agricultural and petroleum industry play a major economic role in the San Joaquin Valley.

The indigenous groups that occupied the San Joaquin Valley region during the ethnographic period were the Yokuts. At one time there were approximately 50 to 60 tribal groups of Yokuts dispersed through the Central Valley and adjacent foothills. The Yokuts were divided into three geographic divisions, the Northern, the Foothill, and the Southern Valley Yokuts. The region around the project area was occupied by a Southern Valley Yokuts tribal group known as the Tulumne (Latta, 1977).

Prehistory of Native American groups in the southern San Joaquin Valley covered thousands of years. Indeed archaeological evidence of prehistoric use in the area spans a period of about 9,000 years. Introduction of the historic period in this region began when the Spanish lead an expedition into the valley in 1772.

An archival record search at the San Joaquin Valley Information Center, California State University Bakersfield, identified 132 recorded archaeological sites within the boundary of the seismic project. Of these cultural properties, six are prehistoric sites and the remaining 110 sites are historic in age. Most of the historic sites are associated with oil and gas exploration and development. Until the precise geophysical source and receiver lines are identified on the ground, it is unknown if any cultural properties will fall within the proposed use corridors.

With implementation of the mitigation measures to avoid all cultural resources properties during seismic operations, no disturbance or impacts to cultural resources are anticipated. Refer to mitigation section. The beneficial effect of the proposed action would result in the compilation of additional cultural information through the discovery and recordation of archaeological resources in a area lacking adequate baseline data.

In regard to Native American traditional lifeway values which may be associated with lands involved on this project, the BLM has requested the views of the Native American community. BLM is currently not aware of any cultural or religious Native American concerns associated with the project area. No comments were received from the Native Americans.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.1 PROPOSED ACTION

Impacts of the proposed action would be similar to those for other geophysical operations such as the Chevron Belridge 3D seismic project conducted in the Lokern area (BioEnvironmental Associates 1993, BioSystems 1991, USFWS 1993) on private lands and government lands managed by the BLM. The primary environmental impacts caused by the proposed action would be surface disturbance associated with the seismic data acquisition phase of the project. Detailed potential impacts are presented below. Potential environmental impacts have been identified in Table 4.1 and are further described in the following sections.

TABLE 4.1
ENVIRONMENTAL IMPACTS

Critical Element	Affected		Critical Element	Affected	
	Yes	No		Yes	No
Air Quality		✓	T & E Species	✓	
ACECs		✓	Wastes, Hazardous/Solid		✓
Cultural Resources		✓	Water Quality		✓
Farmlands, Prime/Unique		✓	Wetlands/Riparian Zones		✓
Floodplains		✓	Wild & Scenic Rivers		✓
Nat. Amer. Concerns		✓	Wilderness		✓

The seismic prospect is proposed over an approximate 65.88 square-mile area (42,164 acres). The project area is composed of valley saltbush scrub and non-native grassland vegetation.

The proposed project includes 34 lines of geophone and associated receiving cable, totaling 295 miles, and 52 source lines totaling 263 miles. Each source line segment will contain 8 shot points spaced 165 feet apart (1,320 feet per source line). If the Midway Valley 3D seismic project is implemented as planned, a maximum of 231 acres may be temporarily impacted by vibroseis pad compaction (8,426 source points x 165 feet x 7.25 pad width/43,560 ft^2 per acre). However, Chevron/Santa Fe anticipates repeating the vibroseis process more than one time at certain source points to collect data from adjacent points ("stacking") to avoid sensitive biological and cultural resources, oil wells and pipelines.

Additionally, numerous oil field roads exist in the project area along which source points may be positioned. Because of this, and the fact that a portion of the project covers city streets in Taft, Chevron/Santa Fe estimates that up to 20% of the source points either will not be "vibed" at all, or may be placed on roads and streets. This could result in roughly 185 acres of vibroseis pad disturbance (231 total potential acres x 80% = 185 acres actually disturbed).

In addition to vibrator pad disturbance, vibroseis truck tire width that exceeds the pad width could result in an additional 24 acres of tire compaction disturbance (8,426 source points x 165 feet x 0.75/43,560 ft^2 per acre) which also may take place along source lines.

If all geophone lines receive some portion of the vibroseis truck travel, an additional 121 acres may be temporarily impacted by off-road vehicle traffic (3.75 foot combined tire width x 8,426 geophone line segments x 165 feet per segment/43,560 ft^2 per acre = 121 acres). Approximately 25% (30 acres) of the 121 acres will not be driven on because the proposed "offset brick" travel pattern will result in some segments of the geophone lines remaining untraveled. Therefore, if vibroseis truck travel along the geophone lines occurs as planned, approximately 91 acres will be impacted by vibroseis truck travel. However, these segments already will have been traveled by the geophone deploying vehicles.

Vehicles deploying geophones will use approved travel paths within the 50 foot wide travel corridor along geophone lines. An additional 16 acres may be temporarily disturbed by vehicles deploying geophones along geophone lines not disturbed by vibroseis truck travel (2 foot 4-wheel drive tire width x 8,426 geophone line segments x 165 feet per segment x 25% undriven segment portions/43,560 ft^2 per acre = 16 acres).

Finally, to enhance data acquisition in the Midway-Sunset oil field, 4 additional geophone lines will be placed halfway between the standard geophone lines which are spaced 1,320 feet apart. Unlike the 30 standard geophone phones in the survey, these additional 4 lines will not be traversed by vibrator trucks during acquisition. Moreover, because the 4 lines are to be located in the Midway-Sunset field area, reduced cross-country travel is anticipated for geophone deployment trucks laying out the 4 lines due to the presence of numerous oil field roads.

The seismic prospect is proposed over an approximate 65.88 square-mile (42,164 acres).

4.1.1 AIR QUALITY

All emissions generated by geophysical operation activities for the proposed project would be temporary duration and minimal in amount. Construction of access roads are not required for the proposed action. Site access will be accomplished by project related vehicles using existing trails and roads and pre-flagged cross country routes after the biological and archeological preactivity surveys, therefore minimal atmospheric emissions of particulate matter (PM-10) in the form of fugitive dust from cross country travel, vibroseis activities, and vehicle exhaust should result. Vehicle traffic is expected to increase by an estimated 10 vehicles per day (including ATVs) for a period of approximately 25 days, which includes transportation of geophysical workers to and from the site. Gaseous emissions from the internal combustion engines of project related vehicles and equipment would include oxides of sulfur (SO_x), oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC). Emissions from geophysical related activities would be localized and limited to about a one month period, and changes in ambient levels of PM, SO_x, NO_x, CO, and VOC would be minimal. No permits are required for the proposed action.

4.1.2 WATER RESOURCES

Cross country travel of geophysical operations is not expected to negatively impact surface water resources, as all impacts would be minor and temporary in nature. If there are significant areas of disturbance, these areas will be stabilized and revegetated to prevent erosion.

4.1.3 GEOLOGY AND SOILS

There would be no impacts to the geologic structure of the area from the proposed action. Negative impacts to soil on the proposed project site would be of short-term duration and created principally from surface disturbance during geophysical testing activities, which may increase erosion slightly.

4.1.4 LAND USE

The seismic data acquisition over the proposed project area would require that approximately 6,880 acres of the public lands in NPR-2 be used as temporary cross country travel areas, which is consistent with existing land uses on and adjacent to NPR-2 as long as potential impacts to the natural environment are mitigated properly. Thus, no direct adverse impacts to land use are anticipated.

4.1.5 WASTE MANAGEMENT

In general, the waste stream and by-products associated with the proposed project would be minimal. However, wooden stakes, flagging, pinflags, and surveyors paints will be used to mark travel routes and to identify the project in the field. Small amounts of items such as vehicle lubricating and hydraulic oils may be used during the project operation for routine maintenance of the project vehicles and some these substances are subject to RCRA hazardous waste

regulations. Any hazardous wastes resulting from project related activities and routine operation of the vehicles would be removed from the project area in accordance with all Federal, State and local laws and regulations with subsequent removal and disposal by a RCRA-licensed-carrier to one of several RCRA permitted hazardous waste facilities.

The project would create small amounts of nonhazardous solid waste (described above) and debris that would be collected for subsequent removal to an approved Class III facility (municipal landfill).

4.1.6 ECOLOGICAL IMPACTS

Any ecological impacts of the proposed action would be created by the direct and indirect impacts to sensitive wildlife and special status plant species and are described below.

Because similar geophysical recording and testing techniques are proposed for the Midway Valley 3D seismic project, the following analysis of impacts section is adapted and modified from BioEnvironmental Associates (1993) that was presented for the Chevron Belridge 3D seismic project that was conducted within the Lokern area.

Effects of the Proposed Project on Listed Plants

The greatest adverse impacts of the proposed project on listed plants would occur as a result of the compaction of soils beneath vibroseis pads. There are numerous sites of *Eriastrum hooveri* documented in the Elk Hills region and on the alluvium on the east side of the Buena Vista Valley. The project skirts this habitat in the northeast portions of sections 31 T30S, R22E, and sections 5, 9, 15, and 23 in T32S and R23E (R. Lewis, pers. comm.). There is potential for unknown sites in the Buena Vista Hills, but no sites have been documented.

In dry soils the effects of compaction are restricted to the first 4-5 inches (BioEnvironmental Associates, 1993). The effects of compaction of wet saturated soils are observed to a depth of 2-3 feet, which can severely damage the root zones of annual plants (Ibid). Compacting wet soils also lowers permeability so severely that water runs off of the compacted surface to adjoining areas and has adverse effects on annual plant growth in the immediate area of the compaction (Ibid).

Geophysical activity appears to have little effect on annual plants growing in source and geophone line corridors. It is unlikely that 3D seismic survey impacts, including access to source, placement of geophone lines, or subsequent collection of geophone lines would significantly affect the resident seed bank of the listed plants as long as the project is carried out as described, and after Hoover's woolly-star seed shatter, and while soil is dry. The pre-vibrosizing phase of the project will be completed before germination. Avoidance of known Hoover's Wooly star locations will be made during vibrosizing operations. Eriastrum skeletons indicate occupied habitat for the species. Such areas will be cleared prior to vibrosizing and will be given 50 foot avoidance zones of any surface disturbing activity.

The Midway Valley 3D seismic survey incorporates a number of project features that will minimize the effects of surface disturbance and soil compaction on listed plants. Localized effects likely would be detectable in post-project monitoring for some time, and strict adherence to disturbance minimizing procedures is of the utmost importance to maintain habitat quality for listed plants, including microflora and organic matter cover. In consideration of all of the mitigation procedures implemented, it is unlikely that project impacts would significantly impair or preclude the long-term persistence of Hoover's woolly-star on the site.

Effects of the Proposed Project on Listed Wildlife.

Chevron/Santa Fe's Midway Valley 3D seismic project will occur during the months of November 1996 through February 1997, thereby avoiding the more environmentally sensitive spring months.

Individual kit foxes, blunt-nosed leopard lizards, giant kangaroo rats, and San Joaquin antelope squirrels may be injured or killed by vehicle strikes as a result of vehicles moving through the project area. However, the likelihood for this type of mortality is relatively low for kit foxes and giant kangaroo rats because of their nocturnal habits and the fact that the seismic testing will be conducted during daylight hours. Burrows and dens will be avoided. Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset. This activity may include significant vehicle travel.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November-February). Blunt-nosed leopard lizard impacts will be minimized using the following measures:

Check surrounding land uses and disturbance for suitable leopard lizard habitat, and

a. Check percent slope, and
b. Check vegetation density, and
c. Check availability of burrows for refuge

Individual kit foxes, blunt-nosed leopard lizards, giant kangaroo rats, and antelope squirrels also may be subject to injury or mortality through accidental entombment in collapsed dens or burrows as a result of vehicle traffic or from ground vibration or compaction caused by the vibroseis trucks. However, recent post-3D follow-up survey information collected from Chevron's Belridge 3D seismic project suggests that small mammal habitats may be negligibly affected by the impacts of 3D seismic activities. Data indicate no long-term impact on habitat use by burrowing rodents within approximately 6 months of completion of a 3D seismic vibroseis project and "...the impacts associated with the activity appear to have had some positive effects on burrow construction by the small mammal community. Moreover, it appears that relatively loose soil along cross country travel paths created by seismic trucks used for geophone and source lines (excluding the bottom of the vibrator pad depression) may have been

especially attractive to burrowing rodents *(BioEnvironmental Associates, 1995)."* Seismic activity will occur early in the San Joaquin kit fox breeding cycle, thus minimizing the potential for entombment of this species. In addition, relevant, pre-existing listed-species sighting information (e.g. BLM and DOE data) will be used to mitigate the potential for entombment. That information will be used in conjunction with information collected during Phase 1 survey activities.

San Joaquin kit foxes, blunt-nosed leopard lizards, giant kangaroo rats and antelope squirrels may indirectly be affected by the proposed action through temporary loss or degradation of habitat. Such loss or degradation could result from ground compaction and crushing of vegetation by trucks. However, the preactivity surveys will avoid these features to the greatest extent possible and thus, inadvertent destruction of kit fox dens and giant kangaroo rat burrows that could result in a net reduction of habitat used by these species for shelter, reproduction, and escape cover will be minimized. Kit foxes, leopard lizards and giant kangaroo rats may escape direct injury if dens and burrows are destroyed, but become displaced into adjacent areas. These animals may be vulnerable to increased predation, exposure, or stress through disorientation and loss of shelter. Moreover, these impacts will be negligible with the implementation of the project mitigations.

Section 9 of the Endangered Species Act of 1969 prohibits any taking (i.e., to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct) of listed fish or wildlife species without special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Under the terms of section 7 (b) (4) and 7 (o) (2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking providing that such taking is in compliance with this incidental take statement. The reasonable and prudent measures described below are non-discretionary and must be undertaken by the agency, the applicant, or made a binding condition of any grant or permit issued to the applicant, as appropriate. The U.S. Fish and Wildlife Service (the Service) anticipates that San Joaquin kit foxes, blunt-nosed leopard lizards, giant kangaroo rats and San Joaquin antelope squirrels may be taken incidentally during the proposed Midway Valley 3D seismic survey. Project actions that may result in mortality, harm, or harassment of these species have been discussed previously in this environmental assessment. Mitigation measures proposed by Chevron/Santa Fe subsequently will reduce, but not eliminate the potential for incidental taking of these species during the project (see Appendix A).

Section 9 of the Endangered Species Act of 1969 does not prohibit the incidental take of listed plant species. Protection of listed plants is provided, however, as the Act requires a Federal permit for removal or reduction, or possession of endangered or threatened plants from areas under Federal jurisdiction,, and prohibits malicious damage or destruction of any such species on any such area, or any act that would remove, cut, dig up, damage or destroy any such species on any other area in knowing violation of any state law or regulation or in violation of a state criminal trespass law. It is anticipated that because of the November to January activity of this

project, impacts will be greatly lessened to sensitive plant species, their seed stock and listed wildlife species.

As a point of clarification and to avoid confusion, it is stipulated that incidental take resulting from this project only will be counted against the incidental take limits of this project and not to any other project previously reviewed for which an incidental take limit was established.

Based upon the foregoing, the Service anticipates that during the proposed Midway valley 3D seismic survey, no more than 1 San Joaquin kit fox, an unspecified number of blunt-nosed leopard lizards, and 1 giant kangaroo rat may be subject to harm or mortality during project related actions. No estimates were given for the California State-threatened San Joaquin antelope squirrel. The Service anticipated, however, that the actual number of animals subject to harm or mortality as a result of project actions (especially burrow collapses) will be difficult to determine because of the cryptic nature of this species and because of recent (1995) data that suggests benefits from seismic activities. Therefore, the Service specified the following incidental take limits for disturbance of dens and burrows during project activities, no more than 2 known San Joaquin kit fox dens, an unspecified number of known blunt-nosed leopard lizard burrows, an unspecified number of active giant kangaroo rat precincts, and numerous (but unqualified) active burrows of other kangaroo rats will be subject to visible destruction or damage during project related activities.

The Service considered the number of animals subject to harassment from noise, vibrations, and human activity during the project to be impractical to estimate. The Service authorized harassment of all federally listed wildlife species inhabiting the project area and adjacent areas, provided that any such harassment was a result of strictly required project activities ; that it was inadvertent; and that all terms and conditions were fully implemented (see Appendix A).

Kit foxes, leopard lizards, giant kangaroo rats and San Joaquin antelope squirrels inhabiting the project area also may be subject to harassment while the project is being conducted. Such harassment may result from displacement of animals to adjacent areas if dens and burrows are destroyed, and from ground vibrations caused by heavy trucks. This displacement is temporary and intermittent over a four month period.

Long-term Effects of the Proposed Project on All Listed Species.

The proposed Midway Valley 3D seismic project could have certain long-term effects within the Midway Valley area. For purposes of this EA, long-term effects are defined as those that would persist 5 years or more after completion of actual survey activities.

Long-term effects primarily would include inadvertent road development and possible future oil production activities in the project area. The former may arise as a result of unauthorized vehicle use of the ground "tracks" left behind by survey vehicles. Such tracks are an attraction to recreational and casual vehicle users and sometimes become *de facto* secondary roads if they are used repeatedly. However, such impacts have not been noted following the Belridge 3D project

which occurred in the adjacent Lokern Area in 1993/94. The latter may result if Chevron/Santa Fe identifies recoverable hydrocarbon reserves as a result of the proposed survey and wishes to develop such reserves. This would result in the construction of exploration and production wells, tank settings, pipelines and other infrastructure associated with active oil fields. Together, these two factors could contribute to long-term habitat degradation within the Midway valley area; however, such effects likely will be addressed and permitted under the Kern County Valley Floor HCP process and/or other federal permitting programs.

Given that Chevron and Santa Fe are two of the largest oil field operators/land holders in the Midway valley area, their joint approach to evaluating acreage with 3D seismic data likely could result in a reduction of the number of future, separate geophysical operations in the area. Hence, long-term impacts to listed species and their habitat will be minimized.

4.1.7 CULTURAL RESOURCES

Until the precise geophysical source and receiver lines are identified on the ground, it is unknown if any cultural properties will fall within the proposed use corridors. With implementation of the mitigation measures to avoid all cultural resources properties during seismic operations, no disturbance or impacts to cultural resources are anticipated. Refer to mitigation section. The beneficial effect of the proposed action would result in the compilation of additional cultural information through the discovery and recordation of archaeological resources in a area lacking adequate baseline data.

4.1.8 FLOODPLAIN AND WETLANDS

The proposed project is located above the 100 year floodplain. No wetlands would be affected by the seismic operation.

4.1.9 NOISE

During seismic operations ambient noise levels would experience minor increases. Because of the remote location of the proposed action, off-site perception of ambient changes in noise levels is not expected. No long-term noise effects are anticipated from the proposed action. No known sensitive receptors exist adjacent to or within the project area.

4.1.10 OCCUPATIONAL HEALTH AND SAFETY

Negative impacts to occupational health and safety are not anticipated as a result of the proposed action. Any potential exposure of workers to hazards from chemical substances or physical agents would be minimized using a combination of engineering controls, work practices and procedures, personal protective equipment while conducting seismic operations in oilfield and remote sites. Training programs are in place and implemented to ensure that workers are knowledgeable of potential hazards and effectively able to use available control measures. Workers will be protected from unexpected hazards arising from operations by adherence to

existing Chevron/Santa Fe safety directives and policies, BLM On-shore Oilfield Directives, DOE Orders, occupational health and safety laws and regulations required by local, state and Federal agencies.

4.2 NO-ACTION ALTERNATIVE

The no-action alternative would create no environmental impacts for federal lands. However, Chevron/Santa Fe could confine the project scope to private lands. Impacts from the private lands alternative would be much the same as those for the proposed project except that they would not involve public land. The no-action alternative could increase the likelihood of future, individual seismic projects within the Midway Valley area.

For cultural resources, the no action alternative would be the same as the proposed action in terms of potential site disturbance or impact. The negative effect of this alternative would be the lack of gathering additional baseline cultural data on both the Federal and private lands.

Under the No-Action Alternative, there would be no impacts on Federal lands only or change to the present environmental conditions at the project site or surrounding area. However, not implementing the proposed action would not allow the BLM and/or DOE access to the seismic data for federal and adjacent mineral prospects. The no-action alternative could increase the likelihood of future, individual seismic projects within the Midway Valley area. The tangible and intangible benefits of evaluating the resource potential of public lands would also not be realized.

4.2.1 SUMMARY OF IMPACTS

IMPACT	PROPOSED ACTION	NO ACTION
Air Quality	Small, short term increases in PM, SO_x, NO_x, CO, and VOC during operation; no permits required.	none
Water Resources	No ground water impacts; surface water impacts minimized by standard mitigation procedures.	none
Geology/Soils	No impacts to geologic structures; possible minimal erosion of soils during operation; site reclamation after operation abandonment will beneficially impact soils in the long term.	none
Land Use	None; some livestock grazing; area intensively utilized for petroleum production and related activities since 1900's.	none
Waste Management	Small amounts of solid waste during operations; minimal quantities of RCRA wastes (paint, vehicle fluids, etc.) during routine operation.	none
Ecology	Site is sparsely vegetated with valley saltbush scrub and non-native annual grassland. Shrubs are present mostly along drainages. A variety of animal species use the general area. Impacts to Federally listed species will be avoided.	none
Floodplain/ Wetlands	none anticipated	none
Socio-economic	Small short term beneficial impacts due to employment.	none
Cultural	none anticipated	none
Visual	none anticipated	none
Noise	Minimal during operations; remote location has no nearby receptors	none
Health/ Safety	none anticipated	none
Cumulative	none anticipated	none

4.3 CUMULATIVE EFFECTS

Cumulative effects are those impacts of future state and private actions that are reasonably certain to occur. Future Federal actions shall be subject to the consultation requirement established in Section 7 of the Endangered Species Act and Section 106 of the National Historic Preservation Act, and therefore, are not considered cumulative to the proposed action.

There are other projects currently under review by State, county, and local authorities where biological surveys have documented the present or former occurrence of the Kern mallow, Blunt-nosed leopard lizard, San Joaquin kit fox, giant kangaroo rat, San Joaquin antelope squirrel and Hoover's woolly-star. These projects include urban development, construction of highways and canals, conversion of natural land for agricultural purposes, mineral and wind energy development, flood control and reservoir construction, rodenticide use, and overgrazing on public and private lands. The cumulative effects of these known actions pose a significant threat to the eventual recovery of these species.

The proposed Chevron/Santa Fe Midway Valley 3D seismic project in this evaluation, considered together with other non-Federal actions, and considering the project mitigations herein described, would not appreciably reduce the likelihood of survival and recovery of the San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, or Hoover's wooly-star.

A detailed description of mitigation measures is presented in Appendix A.

If, during the course of the proposed action, the established amount or extent of incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, or giant kangaroo rat is exceeded, the causative action shall cease and formal consultation shall be reinitiated immediately to avoid violation of section 9 of the Endangered Species Act.

Cumulative effect to cultural resources would be the same as the proposed action.

5.0 LIST OF AGENCIES AND PERSONS CONSULTED

U.S. Fish & Wildlife Service
Sacramento Endangered Species Office
3310 El Camino Ave., Suite 130
Sacramento, CA 95821-6340

Wayne White, Field Supervisor
Peter Cross, Central Valley Branch Chief
Jan Knight, Botanist
Heather Bell, Wildlife Biologist

Stephen Tabor
TWS - Certified Wildlife Biologist
BioEnvironmental Associates
4209 Lantados Street, Suite A
Bakersfield, CA 93307

Rex E. Thomas, PH.D.
BioEnvironmental Associates
4130 Saddle Notch Drive
Fort Collins, CO 80526
(970) 225-9549

J. F. Regal, Soil Scientist
Soil Conservation Service
Bakersfield, CA

Jim Robinson
Environmental Specialist
Santa Fe Energy Resources, Inc.
5201 Truxtun Avenue, Suite 100
Bakersfield, CA 93309
(805) 322-3992

Roslyn Muller
Environmental Engineer/Specialist
ESF&H Dept.,
Western Production Business Unit
Chevron USA, Inc.
4900 California Avenue
P.O. Box 1392
Bakersfield, CA 93302
(805) 633-4438

CDF&G
Jeff Single
1234 East Shaw Avenue
Fresno, CA 93567

Mr. Larry Myers, Executive Secretary
Native American Heritage Commission
915 Capitol Mall, Room 288
Sacramento, CA 95814

Mr. J. R. Manual, President
Native American Heritage Preservation Council
P.O. Box 1507
Bakersfield, CA 93302

Duane M. Garfield Sr., Chairperson
Tule River Reservation
P.O. Box 589
Porterville, CA 93258

Mr. Clarence Atwell Jr., chairperson
Santa Rosa Rancheria
P.O. Box 8
Lemoore, CA 93245

Cherilyn Widell
State Historic Preservation Officer
Office of Historic Preservation
P.O. Box 94296
Sacramento, CA 94296-001

Robert E. Parr
Cultural Resource Facility
California State University Bakersfield
9001 Stockdale Highway
Bakersfield, CA 93311-1099

Souther San Joaquin Valley Information Center
California State University Bakersfield
9001 Stockdale Highway
Bakersfield, CA 93311-1099

6.0 REFERENCES

BioEnvironmental Associates. 1993. Biological evaluation for the Chevron Belridge 3D seismic vibroseis prospect, Kern County, California. Unpubl. Rpt. prepared for Western Geophysical Company. 14 pp. + Maps.

BioEnvironmental Associates. 1995. Evaluation of impacts of the Belridge Geophysical Exploration Project on small--mammal burrows and the endangered plant Kern mallow (Eremalche kernensis) in the Lokern natural area, Kern County, California. Unpubl. Rpt. Prepared for U.S. Bureau of Land Management, Bakersfield, California, 18 pp., + Appendix A.

BioSystems Analysis, Inc. 1991. Sensitive biological resource report for the Chevron Belridge 3D seismic survey, Kern County, California. Unpubl. Rpt. prepared for Chevron Exploration and Production Services, Houston, Texas. 27 pp. + Appendices.

DOE/BLM EA-1124, May 1996 - 3D Seismic

Latta, F. F. 1977. Handbook of the Yokuts, Bear State Books, second edition, Santa Cruz, California

Mitchell, D.L. 1989. Geophysical survey line plant study, Lokern Area, Kern County, California. 16 pp.

Remsen, J.V. Jr. 1978. Bird species of special concern in California, an annotated list of declining or vulnerable bird species. Calif. Dept. of Fish and Game. Nongame Wildlife Investigations, Wildlife Management Branch Administrative Report No. 78-1. 52 pp.

Smith, J.P. and K. Berg. 1988. Inventory of rare and endangered vascular plants of California. California Native Plant Society Special Publication No. 1 (4th edition). California Native Plant Society, Sacramento, CA. 166 pp.

Southern San Joaquin Valley Information Center
California State University, Bakersfield
9001 Stockdale Highway
Bakersfield, California 93311-1099

Taylor, D.Wm. and W.B. Davilla. 1986. Status survey of three plants endemic to the San Joaquin Valley, California. U.S. Fish and Wildlife Service, Sacramento, California. 131 pp.

U.S. Fish and Wildlife Service (USFWS). 1989b. Endangered and threatened wildlife and plants. U.S. Government Printing Office: 1989 0-225-765:QL3. 34 pp.

U.S. Fish and Wildlife Service (USFWS). 1996. Endangered and threatened wildlife and plants: Review of plant and animal taxa that are candidates for listing as endangered or threatened species. Federal Register. 61(40): 7596-7613.

U.S. Fish and Wildlife Service (USFWS). 1993. Reinitiation of formal Section 7 Consultation Concerning Chevron Exploration and Production Services' Proposed Belridge 3D Seismic Survey in the Lokern Road Area, Kern County California. December 17 (1-1-92-F-26-R1) 23 pp.

Williams, D.F. 1986. Mammalian species of special concern in California. California Department of Fish and Game, Wildlife Management Division, Administrative Report 86-1. 112 pp.

APPENDIX A

MITIGATION MEASURES

PROPOSED MITIGATION MEASURES

All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications.

A. Vibroseis avoidance criteria for off-road locations:

- 200 feet from occupied San Joaquin kit fox natal dens;
- 150 feet from known San Joaquin kit fox natal dens;
- 100 feet from occupied San Joaquin kit fox dens;
- 100 feet from known San Joaquin kit fox dens;
- 50 feet from potential San Joaquin kit fox dens;
- 50 feet from giant kangaroo rat burrow systems;
- 30 feet from burrows where San Joaquin antelope squirrel burrows;
- 30 feet from occupied blunt-nosed leopard lizard burrows;
- 30 feet from badger dens;
- 30 feet from burrowing owl burrows;

B. Access route avoidance criterion for off-road vehicle travel:

1. No sensitive wildlife resources shall be located within a 50-foot corridor along access routes and receiver lines.

C. The seismic contractor shall test soil conditions to determine when vehicles can commence activity after the area receives measurable rainfall. The result of soil compaction is a decrease in volume. This decrease can be quantified by measuring the depth of the depression left by the compacting instrument. During the first day of seismic testing, with soil in a dry condition, the project biologist will measure the depth of tire tracks and all vibroseis pad depressions at 20 source points. After measurable rainfall, when surface soils are no longer in a saturated condition, the biologist will measure tire and all vibrator pad depressions at the first source point of the day. If depth measurements of tire tracks and vibroseis pad depressions are more than 75% greater than average measurement taken in dry soil, all off-road vehicle travel will be suspended until conditions improve.

D. Geophones will be placed on BLM and DOE lands in the following manner:

1. All vehicles will avoid driving on areas of cryptogamic soils.

2. The geophones will be walked across cryptogamic soils and areas identified as having high densities of listed plants and deployed by hand in the field.

3. If necessary, biological monitors will be on-site during geophone placement to identify sensitive areas to avoid.

4. Selected geophone lines may be marked on BLM lands to provide line location for post-project monitoring.

E. All source points in areas, on BLM lands, that are found to have high densities of listed plants will be relocated.

F. No off-road vehicle travel (except by ATVs) in areas found to have any densities of listed plants. Vibrator trucks will follow flagged routes around areas of listed plants on BLM lands. A 50 foot avoidance zone for Hoover's wooly star will be enforced.

G. To minimize the potential for incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat the following reasonable and prudent measures are required.

1. The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats shall be minimized.

2. The potential for inadvertent entrapment of San Joaquin kit foxes, blunt-nosed leopard lizards and giant kangaroo rats in dens and burrows shall be minimized.

3. The extent of off-road survey routes and other seismic testing areas shall be minimized.

4. The potential for unauthorized vehicle use of off-road survey routes shall be minimized.

H. The seismic contractor shall provide compliance with the following terms and conditions, which implement the reasonable and prudent measures described above:

1. The potential for harm or mortality to listed wildlife species and their habitats shall be minimized by implementing the following procedures:

a) All measures as proposed by USFWS (1996) for the Chevron/Santa Fe Midway Valley 3D seismic project shall be followed. Mitigation measures presented below incorporate such requirements of the proposed Midway Valley 3D seismic project.

b) Prior to the onset of ground-disturbing project activities, a qualified wildlife biologist shall provide an employee orientation program to project personnel on the occurrence and distribution of listed species in the project area, measures being implemented to protect these species during project actions, reporting requirements shall incidental take occur, and applicable definitions and prohibitions under the Endangered species Act of 1969 Act.

c) Within 4 weeks prior to commencement of seismic testing activities, a qualified biologist(s) shall conduct preactivity surveys of proposed vibrator and geophone travel paths. During pre-activity surveys, the status of previous surveys shall be reviewed. San Joaquin kit fox dens and kangaroo rat and leopard lizard burrows shall be flagged for avoidance, as necessary, and additional habitat features, if any, shall be identified and flagged as necessary.

d) Qualified biologists shall accompany seismic survey vehicles and crews throughout the project area at all times that activities with the potential to affect listed species are being conducted. Qualified biologists may conduct preactivity surveys as described above; should aid seismic crews in satisfying avoidance criteria and implementing project mitigation as described in this evaluation; should aid seismic crews in relocating shot and geophone lines as necessary; should observe and note all pertinent information concerning project effects on listed species; and in general should assist the seismic contractor in conducting the proposed project in such a manner as to minimize adverse effects on endangered and threatened species. At least one qualified biologist shall accompany the vibrator crew working within endangered species habitat.

e) Pets shall not be permitted on the project site during project activities.

f) All food-related trash such as wrappers, cans, bottles, and food scraps shall be disposed of in closed containers only and regularly removed from the project site.

g) All spills of hazardous materials within endangered species habitats shall be cleaned up immediately per Chevron's or other land owner's SPCC plans.

h) Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset.

i) All project-related vehicles shall observe a speed limit of 20 mph or less on all routes that traverse endangered species habitat, except on State and County highways and roads.

j) Within 45 calendar days after completion of the project, the seismic contractor shall

submit to the Service, the BLM, DOE and NPRC a post-activity compliance report that details the following information: dates that seismic testing occurred; pertinent data concerning the seismic contractor's success in meeting project mitigation measures, if any; known project effects on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats, if any (including specific number of dens and small mammal burrows damaged or destroyed); occurrences of incidental take of federally listed species, if any; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats, a summary of rehabilitation plans, if any; and other pertinent information.

2. All known and potential San Joaquin kit foxes dens, giant kangaroo rat burrows, and burrows potentially inhabited by blunt-nosed leopard lizards shall be protected by implementing the following procedures. Such protection will help prevent incidental take of dens and burrows in excess of the take limits described above.

   a) All project vehicles shall observe travel avoidance routes describe in the biological preactivity survey notes that provide avoidance for sensitive wildlife and special status plant resources, unless alterations to these routes are expressly allowed by the biological monitors.

   b) To minimize effects of geophone deployment, the applicant shall utilize approved travel corridors along geophone lines to deploy all off-road geophone lines that occur within endangered species habitat. No vehicles other than geophone deployment vehicles shall be used to deploy geophones in such areas. During geophone deployment, work crews shall make every reasonable effort to avoid sensitive habitat areas such as dens, burrows, and cryptogamic crusts. To the maximum extent practicable, geophone vehicle operators shall avoid such habitat areas by 10 feet. One biologist exclusive of biologists observing vibrator crew activities shall oversee the activities of geophone line deployment crews.

   c) All avoidable San Joaquin kit fox dens and kangaroo rat and blunt-nosed leopard lizard burrows within the immediate vicinity of survey routes shall be prominently staked and/or flagged as necessary to alert project personnel to their presence. All project-related flagging shall be collected and removed after completion of the project.

   d) The applicant shall make every reasonable effort to prevent the collapse of dens and burrows by relocating source points to avoid dens and burrows or other means as determined to be appropriate.

e) Project biologists shall keep an accurate and running tally of the number of dens and burrows damages, destroyed, or otherwise affected by project activities. Such tallies shall be combined and totaled at the end of each work day to determine proximity to take limits and the need for subsequent project modifications to prevent den and burrow effects in excess of take limits. Total number of dens and burrows affected by the project shall be reported in the post-activity compliance report.

f) If damage or destruction to a known San Joaquin kit fox den cannot be avoided during project activities, the BLM, DOE, and USFWS shall be contacted immediately for guidance. Potential kit fox dens that cannot be avoided during project activities may be excavated and backfilled pursuant to Service guidelines without prior notification, provided that excavation is approved and supervised by a project biologist and that such excavation is within incidental take limits provided in the projects biological opinion. Destruction of all kit fox dens shall be reported in the post-activity compliance report.

3. The extent of off-road survey routes and other seismic testing areas shall be minimized by implementing the following procedures:

a) Where seismic lines cross threatened or endangered species habitat, the survey corridor within which testing and ancillary vehicles operate shall be limited to a maximum width of 50 feet (25 feet on either side of the center line). These testing activity zones shall be reduced, where possible, to avoid endangered species sites such as occupied kit fox dens or kangaroo rat burrows.

b) Project related vehicles shall be confined to existing primary or secondary roads or to specifically delineated project areas (i.e., areas that have been surveyed and described in existing documentation). Otherwise, no off-road vehicle travel shall be permitted.

c) Unauthorized vehicle use of off-road survey routes shall be minimized by implementing appropriate measures to prevent unauthorized entry to off-road survey routes, including placement of gates or fences where these routes intersect existing roads, and posting of signs stating that access is not permitted.

I. The following general and specific measures shall be implemented to avoid potential adverse impacts to candidate and California species of special concern and their habitats:

San Joaquin Antelope Squirrel - Impacts can be avoided by staying to the flagged route and avoiding the burrows as marked in the field. In addition, a biologist is recommended to assist project related vibroseis and geophone truck cross country travel so as avoid sensitive resources (burrows) and their habitat(s).

Blunt-nosed leopard lizard - The project area is within the known range of blunt-nosed leopard lizards. Project impacts to blunt-nosed leopard lizard habitat could result from habitat being temporarily destroyed (crushed shrubs and vegetation that serve as loafing cover). This type of impact may be lessened by having a flagged route that vehicles shall follow through areas of low density shrubs and other vegetation. Shrubs and burrows shall be avoided to reduce impacts to over-wintering blunt-nosed leopard lizards.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November-February). Project activities will be conducted during daylight hours when lizard activity is optimum. Impacts to this species could result from lizards being crushed by vehicle traffic. In addition, vibration induced collapse of burrows is a low impact potential if avoidance criteria are complied with. Blunt-nosed leopard lizard impacts will be minimized using the following measures:

1. Check surrounding land uses and disturbance for suitable leopard lizard habitat, and
2. Check percent slope, and
3. Check vegetation density, and
4. Check availability of burrows for refuge

Loggerhead Shrike - Loss of foraging and nesting habitat for the Shrike may result if large shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Le Conte's Thrasher - Loss of potential foraging and nesting habitat for Le Conte's thrashers may result if shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Burrowing Owl - Loss of foraging and nesting habitat for burrowing owls may result as the seismic travel corridor is being used. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Short-eared Owl - This species can fly out of imminent danger, though nesting areas remain vulnerable to seismic travel corridors. Preactivity surveys shall include a thorough inspection of the proposed seismic travel corridor and proposed access travel paths to ensure that nests of this species are not destroyed. Young owls are especially vulnerable to collisions with vehicles, particularly during foraging bouts. Increased disturbance and mortality would lower breeding success, and may cause the owls to abandon the site. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites. The recommended mitigation measures, in

general, should greatly reduce the potential for impacts to short-eared owls within the project area.

Vegetation and Habitat Types

J. Project related vehicles shall be restricted to approved travel routes and paths/roads. Large shrubs shall be avoided in an effort to minimize impact to wildlife habitat. Large shrubs shall be avoided by carefully selecting travel paths/roads to avoid crushing individuals. In addition, washes represent a fragile habitat type and function as seasonally productive sources of annual vegetation for animals, as dispersal corridors, and as areas affording favorable burrow construction habitat. Washes shall be avoided by all vehicular activity as feasible.

K. If during any phase of the seismic operation any oil or other pollutant shall be discharged from project related vehicles, or from containers impacting Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of holder to control, cleanup or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

ADDITIONAL MITIGATION

Cultural Resources

1. Prior to initiation of field work, all field supervisors and personnel shall be briefed by an archaeologist or cultural specialist about the general cultural background for the region and the sensitivity of cultural resources in the project vicinity. The archaeologist shall inform project personnel to avoid flagged areas, not to collect or disturb artifacts, and to report any late discovery of cultural resources in the project vicinity to the archaeologist.

2. Once land surveyors pin flag the center line of the geophone and source lines, an intensive cultural inventory on all seismic corridors will be conducted in advance of land disturbing activities; e.g., vibroseis trucks, cross country vehicles.

3. All cultural sites will be flagged for avoidance including a safe buffer zone to prevent any disturbance to them and monitored for compliance by an archaeologist. Once seismic activities in the area cease, flagging will be removed.

4. Archaeologist shall be present during all potentially damaging project activities that are near

2. Once land surveyors pin flag the center line of the geophone and source lines, an intensive cultural inventory on all seismic corridors will be conducted in advance of land disturbing activities; e.g., vibroseis trucks, cross country vehicles.

3. All cultural sites will be flagged for avoidance including a safe buffer zone to prevent any disturbance to them and monitored for compliance by an archaeologist. Once seismic activities in the area cease, flagging will be removed.

4. Archaeologist shall be present during all potentially damaging project activities that are near cultural resources unless flagging alone is determined sufficient for avoidance. The project archaeologist shall assist field personnel in avoiding disturbance to cultural sites.

5. Should any disturbance occur to cultural resources during the project, it shall be immediately reported to the BLM/DOE authorized staff. All work in the immediate area of disturbance shall cease until approval to proceed is given by the BLM/DOE authorized officers, subsequent to completion of cultural compliance.

6. The archaeological contractor will provide at a minimum a weekly status report to BLM/DOE on project progress or more frequently should problems arise. The report will at a minimum include the number of miles surveyed, number of sites discovered and recorded or updated, areas where vibroseis activities have been completed, the number of sites flagged for avoidance, and the results of monitoring activities.

7. After completion of the project, a complete archaeological report prepared by the archaeological contractor with the results of the cultural investigation, the number of sites avoided, and assessment of monitoring activities will be provided to the SHPO, with copies to BLM and DOE.

APPENDIX B

U.S. FISH AND WILDLIFE SERVICE CONSULTATION AND BIOLOGICAL ASSESSMENT

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Sacramento Field Office
3310 El Camino Ave, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:

1-1-96-F-120

November 12, 1996

Mr. James W. Abbott
Area Manager
Bureau of Land Management
3801 Pegasus Drive
Bakersfield, CA 93308

Subject: Endangered Species Formal Consultation on the Midway Valley 3D Geophysical Exploration Project Proposed by Chevron U.S.A., Inc. and Sante Fe Energy Resources in Western Kern County, California.

Dear Mr. Abbott:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on the Service's review of the Midway Valley 3D Geophysical Exploration project proposed by Chevron U.S.A., Inc. and Sante Fe Energy Resources in western Kern County, California, and its effects on the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*), giant kangaroo rat (*Dipodomys ingens*), blunt-nosed leopard lizard (*Gambelia silus*), Kern mallow (*Eremalche kernensis*), and threatened Hoover's woolly-star (*Eriastrum hooveri*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). Your July 8, 1996, request for formal consultation was received on July 10, 1996. After review of the initial information the Service and the Bureau of Land Management (BLM) determined that the proposed project would not affect Kern mallow because the proposed project is located well outside all known populations of this plant. On October 30, 1996, BLM sent a letter withdrawing Kern mallow from the consultation.

This biological opinion is based on the following: (1) information provided during an initial meeting of May 22, 1996 between the Service, BLM and representatives from Chevron U.S.A., Inc. and Sante Fe Energy Resources; (2) the July 8, 1996, BLM memorandum and accompanying project description and biological evaluation; (3) the July 19, 1996, letter from Chevron U.S.A., Inc.; (4) the August 6, 1996, letter from the Department of Energy (DOE); (5) the August 21, 1996, letter and aerial photos; (6) the August 23, and October 30, 1996, letters; (7) September 12, 13, 16, 17, and October 15, 1996, faxes from Chevron U.S.A., Inc.; (8) the October 31, 1996, BLM memorandum and accompanying updated project description and biological evaluation; (9) conversations with Chevron U.S.A., Inc. and BLM staff; and (10) other sources of information. A complete administrative record of this consultation is on file in this office.

BIOLOGICAL OPINION

Description of the Proposed Action

Chevron U.S.A., Inc. and Sante Fe Resources have contracted Western Geophysical to conduct a geophysical 3D seismic survey in Midway Valley located in western Kern County, California. The project specific location is provided in figure 1. The project proponents' complete and updated project

description and biological evaluation have been attached as appendix A, and a brief synopsis is below.

The project spans 42,164 acres, or 66 square miles. Land ownership/mineral rights involved include approximately 31,444 acres of private lands (of which 20,223 acres, or 64 percent of the total, are owned by Chevron U.S.A., Inc./Santa Fe Resources), 6,880 acres of military reservations (DOE's Naval Petroleum Reserve 2), and 3,840 acres of land administered by the BLM. There are 9,373 acres of native habitat, 8,717 acres of low, 11,945 acres of moderate, 9,851 acres of high disturbance from oil field development, 175 acres in agricultural production, and 2,203 acres of urban development.

The project involves establishing approximately 34 lines of receiver stations (geophones) and 52 source lines over the 66 square mile area. Source lines will consist of eight vibroseis (source) points, 165 feet apart, positioned in a staggered array ("brick" pattern) perpendicular to the receiver lines (southwest to northeast) (Figure 2).

It is estimated that a maximum of 392 acres may be temporarily impacted by the proposed project from: (1) vibroseis pad compaction (185 - 231 acres); (2) vibrator truck tire compaction (24 acres); (3) off-road vehicle traffic by vibroseis trucks (91 - 121 acres); and, (4) geophone deploying trucks (16 acres).

In order to minimize potential impacts to threatened and endangered species within the project area, seismic data acquisition is scheduled to begin November 1, 1996, and conclude by late-February 1997.

Species Status

San Joaquin kit fox

The San Joaquin kit fox was listed as endangered by the U.S. Department of the Interior in 1967 (32 FR 4001) and by the State of California in 1971. A recovery plan approved in 1983 proposed interim objectives of halting the decline of the San Joaquin kit fox and increasing population sizes above 1981 levels (USFWS 1983). In 1996 preliminary draft recovery plan for San Joaquin Valley upland terrestrial species was drafted which includes a revised recovery plan for the kit fox (USFWS 1996). The following information is extracted and edited from that draft. Citations and further information are in the approved Recovery Plan for this species and preliminary draft Recovery Plan.

Kit foxes diet varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. In the southern portion of their range, kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp.), white-footed mice (*Peromyscus* spp.), and other nocturnal rodents comprise about one-third or more of their diets. Kit foxes also prey on California ground squirrels (*Spermophilus beecheyi*), black-tailed hares (*Lepus californicus*), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), desert cottontails (*Sylvilagus audubonii*), ground-nesting birds, and insects. Vegetation and insects occur frequently in feces. Dens are used by the fox for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Kit foxes excavate their own dens, use those constructed by other animals, and use human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). Kit foxes often change dens and numerous dens may be used throughout the year. However, evidence that a den is being used by kit foxes may be absent. Kit foxes are subject to competitive exclusion or predation by other species, such as the non-native red fox (*Vulpes vulpes*), coyote (*Canis latrans*), domestic dog (*Canis familiaris*), bobcat (*Felis rufus*), and large raptors.

Giant kangaroo rat

The giant kangaroo rat was listed as endangered by the U.S. Department of the Interior in 1987 (52 FR 283-288) and by the State of California in 1980. In 1996 a preliminary draft recovery plan for San Joaquin Valley upland terrestrial species was drafted which includes the giant kangaroo rat (USFWS 1996). The following information is extracted and edited from that draft. Citations and further information are in the preliminary draft Recovery Plan.

The historical distribution of giant kangaroo rats encompassed a narrow band of gently sloping ground along the western edge of the San Joaquin Valley, with occassional colonies on steeper slopes and ridge tops, from the base of the Tehachapi Mountains, Kern County in the south, to near Los Banos, Merced County in the north. Historical habitat was estimated to have encompassed 1,561,017 acres (631,724 ha). The species population is currently fragmented into six major geographic units. The units located in the southern San Joaquin Valley are: the Kettleman Hills in Kings County; and western Kern County in the area of the Lokern, Elk Hills, and other uplands around McKittrick, Taft, and Maricopa. The major units are fragmented into more than 100 smaller populations, many of which are isolated by several miles of barriers such as steep terrain with plant communities unsuitable as habitat, or agricultural, industrial, or urban land without habitat for this species. Extant habitat is estimated to be 27,540 acres (11,145 ha), about 1.8 percent of historical habitat.

Within the area of currently occupied habitat, populations of giant kangaroo rats studied since 1979 have expanded and declined 6 to 10 fold with changing weather patterns. Density estimates range from 2.5 to 275 animals per acre (1 to 110 per ha). Changes in density generally coincide with amount of rainfall and herbaceous plant productivity, however, the seed caching behavior of these rats may offset this effect. Giant kangaroo rats are primarily seed eaters, caching ripening seed heads in small surface pits or large stacks on the surface over their burrow system. After curing for several weeks, seeds are transported to underground larders. Giant kangaroo rats forage on the surface from around sunset to near sunrise, with most activity taking place in the first 2 hours after dark. Foraging activity is greatest in the spring as seeds of annual plants ripen. Giant kangaroo rats develop burrow systems with one to five or more separate openings, of two types: a vertical shaft with a circular opening and no dirt apron; and a larger, more horizontally-opening shaft, usually wider than high with a well-worn path leading from the mouth.

Kangaroo rats have an adaptable reproductive pattern that is affected by both population density and availability of food. In most years, females are reproductive between December and April, but in colonies with low densities, reproduction extended into late summer. The major time for dispersal of giant kangaroo rats seems to be following maturation of young, about 11-12 weeks after birth. Predators of giant kangaroo rats are numerous and include most rodent-hunting mammals, snakes, and owls.

Preferred habitat of giant kangaroo rats is annual grassland on gentle slopes of generally less than 10°, with friable, sandy-loam soils. However, most remaining populations are on poorer and marginal habitats which include shrub communities on a variety of soil types and on slopes up to about 22°.

Blunt-nosed leopard lizard

The blunt-nosed leopard lizard was listed as endangered by the U.S. Department of the Interior in 1967 (32 FR 4001) and by the State of California in 1971. A recovery plan was first prepared in 1980 (USFWS 1980) and revised in 1985 (USFWS 1985). In 1996 a preliminary draft recovery plan for San Joaquin Valley upland terrestrial species was drafted which includes the blunt-nosed

leopard lizard (USFWS 1996). The following information is extracted and edited from that draft. Citations and further information are in the approved Recovery Plans and preliminary draft Recovery Plan.

The blunt-nosed leopard lizard is a relatively large lizard of the family Iguanidae and is endemic to the San Joaquin Valley, inhabiting open, sparsely vegetated areas of low relief on the Valley floor and the surrounding foothills. Although the boundaries of its original distribution are uncertain, blunt-nosed leopard lizards probably occurred in the San Joaquin Valley from Stanislaus County in the north, southward to the Tehachapi Mountains in Kern County, the Carrizo Plain and Cuyama Valley, and the foothills of the Sierra Nevada and Coast Range Mountains. In general, leopard lizards are absent from areas of steep slope, dense vegetation, or areas subject to seasonal flooding.

The currently occupied range of the blunt-nosed leopard lizard is in scattered parcels of undeveloped land on the Valley floor, where they are most commonly found in the Annual Grassland and Valley Sink Scrub. These lizards also inhabit Alkali Playa and Valley Saltbush Scrub. In the southern San Joaquin Valley, extant populations are known to occur on the Kern and Pixley National Wildlife Refuges, Liberty Farms, Allensworth, Antelope Plain, Buttonwillow, Elk Hills, and Tupman Essential Habitat Areas, on the Carrizo and Elkhorn plains, north of Bakersfield around Poso Creek, and in western Kern County around the towns of Maricopa, McKittrick, and Taft.

Blunt-nosed leopard lizards feed primarily on insects, lizards, and occasionally plant material. Because they have similar diets, interspecific competition probably occurs between the blunt-nosed leopard lizard and California whiptail (*Cnemidophorus* spp.).

Breeding activity begins within a month of emergence from dormancy and lasts from the end of April through the beginning to end of June. Male territories may overlap those of several females, and a given male may mate with several females. Two to six eggs are laid in June and July, and their numbers are correlated with the size of the female. Under adverse conditions, egg-laying may be delayed 1 or 2 months or reproduction may not occur at all. Females typically produce only one clutch of eggs per year, but some may produce three or more under favorable environmental conditions. After about 2 months of incubation, young hatch from late July through early August, rarely to September.

Males are highly combative in establishing and maintaining territories. Male and female home ranges often overlap. The mean home range size varies from 0.25 to 2.7 acres (0.1 to 1.1 ha) for females and 0.52 to 4.2 acres (0.2 to 1.7 ha) for males. Densities estimates range from 0.1 to 4.2 lizards per acre (0.3 to 10.8 per ha). Population densities in marginal habitat generally do not exceed 0.2 blunt-nosed leopard lizards per acre (0.5 per ha). There are no current overall population size estimates for the species.

Leopard lizards use small rodent burrows for shelter from predators and temperature extremes. Burrows are usually abandoned ground squirrel tunnels, or occupied or abandoned kangaroo rat tunnels. Each lizard uses several burrows without preference, but will avoid those occupied by predators or other leopard lizards. In areas of low mammal burrow density, lizards will construct shallow, simple tunnels in earth berms or under rocks. Potential predators are numerous and include snakes, predatory birds, and most carnivorous valley mammals.

Seasonal above-ground activity is correlated with weather conditions, primarily temperature. Lizards are active on the surface when air temperatures are between 73 and 104°F (23.5 and 40.0°C) and surface soil temperatures are 71 and 122°F (22 and 50°C). Optimal activity occurs when

ground temperatures are between 71 and 97°F (22 and 36°C) or slightly higher. Smaller lizards and young have a wider activity range than the adults.

Hoover's Woolly-Star

Hoover's woolly-star was federally listed as threatened on July 19,1990 (55 FR 29370). It is a small annual herb of the phlox family that produces 1/4-inch wide white flowers and is densely hairy on the stems, leaves, and some flowering parts. Field surveys conducted throughout the southern San Joaquin Valley by Federal agencies and private consultants in 1992 and 1993 have documented numerous occurrences of Hoover's woolly-star. Surveys have shown that Hoover's woolly-star populations range from the upper Cuyama Valley near Ventucopa, Santa Barbara County, northward to the Panoche Hills in San Benito County, a distance of approximately 140 miles. Hoover's woolly-star occurs in 42 USGS 7 ½ - minute quadrangles within Kings, Kern, San Luis Obispo, Santa Barbara, San Benito, and Fresno counties. Hoover's woolly-star occurrences primarily are located within four areas. The four areas from largest to smallest are: (1) the Kettleman Hills area, (2) the Carrizo Plain-Elkhorn Plain-Temblor Range-Caliente Mountains-Cuyama Valley-Sierra Madre Mountains area, (3) the Lokern-Elk Hills-Buena Vista Hills-Coles Levee-Maricopa-Taft area, and (4) the Antelope Plain-Lost Hills-Semitropic area. Additional, more isolated populations occur throughout the region. An intra-agency draft recovery plan has been developed for Hoover's woolly-star. Hoover's woolly-star is now known from Fresno, Kings, San Luis Obispo, and Santa Barbara Counties at scattered locations spanning a distance of 100 miles in the inner southern Coast Range of central California. The species is now documented from over 600 sites that cover some 2,200 acres. Hoover's woolly-star appears to prefer slightly sandy, sometimes silty soils that often exhibit cryptogamic crusts and is found on ridgetops, hillsides, benches, alluvial fans, and level areas at elevations from 280 to 2,770 feet. It continues to be threatened throughout parts of its range by oil and gas development, cattle and sheep grazing, agricultural-land conversion, urbanization, and other surface-disturbing activities. The majority of known locations of Hoover's woolly-star are on BLM lands or combinations of BLM/split-estate/private lands (BLM 1993).

Environmental Baseline

San Joaquin kit fox

In the San Joaquin Valley, prior to 1930, the range of the San Joaquin kit fox extended from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side. Historically, San Joaquin kit foxes occurred in several San Joaquin Valley native plant communities. In the southern-most portion of the range these communities included Valley Sink Scrub, Valley Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. By 1930 the kit fox range had been reduced by more than half, with the largest portion remaining in the southern and western parts of the Valley. By 1958 an estimated 50 percent of the Valley's original natural communities had been lost. This loss was due to extensive land conversions and intensive land uses, including the use of pesticides. By 1979, only about 6.7 percent of the San Joaquin Valley's original wildlands south of Stanislaus County remained untilled and undeveloped. Today many of these communities are only represented by small, degraded remnants. Kit foxes are, however, found in grassland and scrubland communities which have been extensively modified by humans with oil exploration, wind turbines, agricultural practices, and/or grazing.

Loss and degradation of habitat by agricultural, industrial, and urban developments and associated practices continue, decreasing the carrying capacity of remaining habitat and threatening kit fox survival. Such loss contribute to kit fox declines through displacement, direct and indirect

mortalities, barriers to movement, and reduction of prey populations (USFWS 1996).

Population monitoring of listed vertebrate species at the NPR Complex in 1995 indicate that approximately 50 percent fewer foxes were captured during the 1995 annual San Joaquin kit fox population monitoring trapping session than in 1994. This decrease was likely caused by sharp declines in the abundance of kangaroo rats, other rodents, and leporid prey species, possibly depressing overall reproductive success and survival (Otten 1996).

Giant kangaroo rat

Completion of Federal and State water projects resulted in rapid cultivation and irrigation of giant kangaroo rats habitat. Urban and industrial developments, petroleum and mineral exploration and extraction, new energy and water conveyance facilities, and construction of communication and transportation infrastructures continue to destroy habitat for giant kangaroo rats and increase the threats to the species by reducing and further fragmenting populations. Use of rodenticide-treated grain to control ground squirrels and kangaroo rats also may have contributed to the decline of giant kangaroo rats. The impending sale of the Naval Petroleum Reserves in California to private interests represents a threat to one of the three largest regional populations of giant kangaroo rats (USFWS 1996).

During and following the 1994-1995 winter, biologists noted a decline in abundance of kangaroo rats in the southern San Joaquin Valley. Lower than expected trapping results, and decreased signs of activity were observed at several dispersed sites. Dramatic declines were noted for short-nosed, Tipton, and Heermann's kangaroo rats, although only modest reductions were noted for giant kangaroo rat populations on the valley floor (Single et al. 1996). The Lokern Area giant kangaroo rat population appeared to be only slightly recovered during the 1996 giant kangaroo rat trapping conducted in Lokern Area by the California Energy Commission (L. Speigel, pers. comm). Population monitoring of listed vertebrate species at the NPR Complex in 1995 indicated that giant kangaroo rat abundance was lower than in previous years, possibly related to the unusually high precipitation in the spring of 1995 (Hill 1996).

Blunt-nosed leopard lizard

Stebbins, in 1954, first recognized that agricultural conversion of its habitat was causing the extirpation of the blunt-nosed leopard lizard. Cultivation, petroleum and mineral extraction, pesticide applications, off-road vehicle use, and construction of transportation, communication, and irrigation infrastructures collectively have caused the reduction, fragmentation of populations and decline of blunt-nosed leopard lizards.

Habitat disturbance, destruction, and fragmentation continue as the greatest threats to blunt-nosed leopard lizard populations. Disturbances and modifications of habitats within areas of mineral and petroleum development pose lesser, but continuing threats as they degrade the habitat. Direct mortality occurs when animals are killed in their burrows during construction, killed by vehicle traffic, drowned in oil, or fall into excavated areas from which they are unable to escape. Displaced lizards may be unable to survive in adjacent habitat if it is already occupied or unsuitable for colonization.

Livestock grazing can result in removal of herbaceous vegetation and shrub cover and destruction of rodent burrows used by lizards for shelter. Unlike cultivation of row crops, which precludes use by leopard lizards, light or moderate grazing may be beneficial. The use of pesticides may directly and indirectly affect blunt-nosed leopard lizards. The insecticide Malathion has been used since 1969 to control the beet leafhopper, and its use may reduce

insect prey populations. Fumigants such as methyl bromide are used to control ground squirrels. Because leopard lizards often inhabit ground squirrel burrows, they may be inadvertently poisoned (USFWS 1996).

Population monitoring of listed vertebrate species at the NPR Complex in 1995 indicated a lower abundance of blunt-nosed leopard lizard adults. This may in part be due to the increase in the amount of vegetative cover likely resulting from above average precipitation early in this year (EASI 1996).

Hoover's Woolly-Star

Populations of Hoover's woolly-star, with an estimated total of more than 6,000 individual plants, have been identified on DOE's Naval Petroleum Reserve. A current comprehensive floristic survey on NPR-1, part of the NPR Complex, has resulted in many new occurrences of Hoover's woolly-star being discovered (Hinshaw 1996). The 1995 Annual Report on the Endangered Species and cultural resources program at NPR Reserves in California documented a minimum of 278 Hoover's woolly-star localities on or adjacent to the NPR Complex (EG&G 1995).

In summary, Midway Valley is located between areas already identified for their biological significance and their critical importance to listed species recovery efforts: the Lokern Area is about 6 miles to the northeast, and DOE's NPR-2 is adjacent on the southeast. However, the biological resources of Midway Valley are not well documented. Ongoing research and population monitoring at the NPR Complex provides the Service with the best available data from which to produce the environmental baseline. Some information is available from the Lokern Area and the Midway/Sunset Oil Fields, unfortunately there has not been the consistent monitoring needed.

The Service is concerned that the above mentioned detrimental effects to listed species from the unusually high precipitation combined with other actions such as the ongoing degradation and fragmentation of listed species habitat within the NPR Complex (USFWS 1995,) successful recovery of these effected species to pre-1995 levels is at risk. Additionally, long-term uncertainty of ownership of NPR-1, which has been identified as essential to recovery actions, puts the future of the listed species within the greater action area at even more risk. The Service is closely monitoring and evaluating all actions and environmental conditions in the southern San Joaquin Valley. The proposed project may be beneficial by providing data on listed species habitat and presence in the Buena Vista Valley. This would enhance future environmental baseline information.

Effects of the Proposed Action on Listed Species

Direct Effects on Listed Wildlife

Adverse effects of the proposed Midway Valley 3D geophysical exploration project on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats may result from several sources. Individual kit foxes, leopard lizards, and kangaroo rats may be injured or killed by vehicle strikes as a result of vehicles moving through the project area. However, the likelihood of this type of morality is relatively low for kit foxes and kangaroo rats, due to their nocturnal habits. The geophysical testing will only be conducted during daylight hours. The potential for moving vehicle encounters with kit fox pups and leopard lizards would be somewhat higher if the project is conducted during their above-ground activity period. This project has been scheduled so as to avoid both of these activity periods. Additionally, no off-road vehicle travel is allowed except within approved access routes on which pre-activity surveys have been conducted, with the vibroseis trucks accompanied into and through the project area by a qualified biological monitor, and all other project-related vehicles observing a speed limit of 20

MPH or less on all routes that traverse endangered species habitat, except as posted on State and County highways and roads.

Individual kit foxes, leopard lizards and giant kangaroo rats also may be subject to injury or mortality through accidental entombment in collapsed dens or burrows as a result of vehicle traffic or from ground vibration caused by the vibroseis trucks. Individuals may also be temporarily or permanently displaced into adjacent areas and be vulnerable to increased predation, exposure, or stress through disorientation and loss of shelter. The potential for entombment will be minimized by measures described in preceding paragraph, the proposed buffers which will be physically established around sensitive habitat features prior to project activity, the narrowing of the 50-foot access route or allowing only foot traffic to avoid sensitive habitat features, and the potential relocation or "stacking" of source points to avoid sensitive habitat features. Additionally, seismic activity will occur early in the San Joaquin kit fox breeding cycle, minimizing the potential for entombment of adults and their pups. Displacement of individuals into adjacent areas will be minimized by the timing and duration of the project, which is such that the most active above ground periods for the giant kangaroo rat, blunt-nosed leopard lizard, and juvenile San Joaquin kit foxes will be minimized. Because adult San Joaquin kit foxes are usually familiar with their home range and change dens routinely, they are not as likely to be as affected as juveniles who may be less familiar with nearby cover and escape opportunities.

Indirect Effects on Listed Wildlife

San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats may be indirectly affected by the proposed action through temporary loss or degradation of home ranges and adjacent areas. Such loss or degradation could result from human presence, and because of ground compaction and crushing of vegetation by vibroseis and geophone trucks. However, the temporal nature of the project, and the project's timing (as mentioned above) are such that the loss or degradation of habitat from human presence has been minimized. Ground compaction may have an effect on the giant kangaroo rats ability to use those areas for burrowing. However, recent post-3D follow-up survey information collected from Chevron U.S.A., Inc.'s Belridge 3D seismic project suggests that small mammal habitat may be negligibly effected from the impact of 3D seismic acquisition. Data indicate that no long-term impact on habitat use by burrowing rodents was evident within approximately 6 months of completion of a 3D vibroseis seismic project and "...the impacts associated with the activity appear to have had some positive effect on burrow construction by the small mammal community. Moreover, it appears that relative loose soil along cross country travel paths created by seismic trucks used for geophone and source lines (excluding the bottom of the vibe pad depression) may have been especially attractive to burrowing rodents" (Tabor and Thomas 1995). Caution should be exercised, however, because this study looks only at one location with specific soil and vegetation types and one years precipitation pattern; it may not be representative of the effects of all 3D seismic surveys.

Kit foxes, leopard lizards, and kangaroo rats inhabiting the project area also may be subject to harassment while the project is being conducted. Such harassment may result from ground vibrations, burrow and den destruction, and from the inherent increase in vehicular traffic and human presence. The potential for harassment will be minimized by measures described in preceding paragraphs, specific measures regarding employee training, pets, and trash, and the presence of biological monitors. However, harassment to individuals from noise and vibration is inherent in this activity and unavoidable.

Direct Effects on Hoover's Woolly-Star

The greatest adverse impacts of the proposed project on Hoover's Woolly-Star

would occur as a result of the compaction of soils beneath the vibe pads. Soil compaction and associated habitat degradation are the major adverse effects of the project with respect to listed plants.

It is unlikely that 3D seismic survey impacts, including access to source, placement of geophone lines, or subsequent collection of geophone lines would significantly affect the resident seedbank of the listed plants as long as the project is carried out after Hoover's woolly-star seed shatter and while the soil is dry. It is possible that some Hoover's woolly-star seeds may germinate if sufficient moisture is received during the project and compaction on dry or moist soils may adversely affect these seedlings. Most germination will occur from January or February until mid-April (Ellen Cypher, pers. comm. 1996).

The Midway Valley 3D seismic survey has incorporated a number of project features that will minimize surface disturbance and soil compaction effects on listed plants. Localized project effects likely would be detectable in post-project monitoring for some time, and strict adherence to disturbance-minimizing procedures is of the utmost importance to maintain habitat quality for listed plants, including surgace microflora and organic matter cover. On a project-wide basis, in consideration of all the mitigation procedures implemented, it is unlikely that project impacts would significantly impair or preclude the long-term persistence of Hoover's woolly-star on the site.

Additional Indirect Effects on All Listed Species

Finally, the proposed Midway Valley 3D geophysical exploration project could have certain long-term effects to San Joaquin Valley threatened and endangered species within the Midway Valley area. These would include inadvertent road development that may arise as a result of unauthorized vehicle use of the "tracks" left after the project is completed. Such tracks are an attraction to recreational and casual vehicle users and sometimes become *de facto* secondary roads if they are used repeatedly. However, such impacts have not been noted following the Belridge 3D project which occurred in the adjacent Lokern Area in 1993 and 1994 (Tabor and Thomas 1995).

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative effects on the San Joaquin kit fox, giant kangaroo rat, blunt-nosed leopard lizard, and Hoover's woolly-star include ongoing habitat destruction, degradation, and fragmentation by conversion to agricultural, water conveyance facilities, and urban and industrial uses.

Habitat degradation would be further intensified if other oil operators in the Midway Valley area also propose seismic surveys. Repeated surveys could result in long term habitat degradation. However, given the prohibitive cost of such an extensive survey, and the difficulty other oil operators would have in securing landowner permission, it is not anticipated that another 3D seismic survey of this magnitude within this same valley would be likely. Smaller surveys are, however, still a possibility.

Conclusion

After reviewing the current status of the San Joaquin kit fox, giant kangaroo rat, blunt-nosed leopard lizard, and Hoover's woolly-star, the environmental baseline, the effects of the proposed project, and the cumulative effects, it

is the Service's biological opinion that the Midway Valley 3D geophysical exploration project, as proposed, although affecting individuals, is not likely to jeopardize the continued existence or recovery of the listed species covered under this biological opinion. No critical habitat has been designated for these species, therefore, none will be affected.

-- INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

Amount or Extent of Take

The Service anticipates that San Joaquin kit foxes, giant kangaroo rats, and blunt-nosed leopard lizards may be taken incidentally during the proposed project. Project actions that may result in mortality, harm, or harassment of these species have been discussed previously in this biological opinion. Minimization and avoidance measures proposed by BLM and the applicants will substantially reduce, but not eliminate, the potential for incidental taking of these species during the project.

The Service anticipates that incidental take of San Joaquin kit foxes, giant kangaroo rats, and blunt-nosed leopard lizards will be difficult to detect for the following reason(s): small body size; finding a dead or impaired specimen is unlikely; losses may be masked by seasonal fluctuations in numbers or other causes; and the species occurs in dens or burrows. However, the following level of take of these species can be anticipated by the loss of habitat, including food, cover, hibernaculum, and/or breeding sites.

Based on the foregoing, the Service anticipates that the following types and levels of incidental take may occur during the proposed geophysical project:

For San Joaquin kit foxes incidental take is expected to be in the form of;

a. one (1) mortality due to entombment, vehicular strikes, or any other activities associated with the proposed project, and

b. harm and harassment of one (1) pair of foxes and associated young due to the destruction of one (1) occupied natal den, and two (2) pairs of foxes due to the destruction of two (2) unoccupied natal dens by significantly effecting the reproductive success of kit fox pairs by impairing behavioral patterns, including breeding or the feeding and sheltering of young, and

c. harm through loss of habitat, including potential and known non-

natal dens, and foraging areas within the 392 acre footprint of the proposed project, and

d. harassment from project related noise and vibration, and the displacement of individuals within the 392 acre footprint of the proposed project and an additional 500-foot area adjacent to the access routes and staging areas.

For blunt-nosed leopard lizards we anticipate incidental take in the form of;

a. mortality through loss of unavoidable burrows, and, if present, the individuals therein, within the 392 acre footprint of the proposed project, and

b. harm through degradation of habitat patches, including crushing of vegetation which may harbor prey items, within the 392 acre footprint of the proposed project, and

c. harassment from project related noise and vibration, and the displacement of individuals within the 392 acre footprint of the proposed project and an additional 30-foot area adjacent to the access routes and staging areas.

For giant kangaroo rats we anticipate incidental take in the form of;

a. one (1) mortality due to entombment in an unavoidable occupied precinct, or vehicular strike,

b. harm and mortality through inadvertent entrapment within seemingly unoccupied precincts, within the 392 acre footprint of the proposed project, and

c. harm through degradation of foraging areas, including compaction and crushing of vegetation, within the 392 acre footprint of the proposed project, and

d. harassment from project related noise and vibration, and the displacement of individuals within the 392 acre footprint of the proposed project and an additional 30-foot area adjacent to the access routes and staging areas.

Sections 7(b)(4) and 7(o)(2) of the Act do not apply to the incidental take of listed plant species. However, protection of listed plants is provided to the extent that the Act requires a Federal permit for removal or reduction to possession of Federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of the respective State or in the course of any violation of that State's criminal trespass law.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species addressed.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impact of the take on San Joaquin kit fox, giant kangaroo rat, and blunt-nosed leopard lizard populations:

1. Minimize the potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats.

2. Assist the Service in identifying the impacts of 3D Geophysical Exploration on listed species.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must ensure that Chevron U.S.A., Inc., Sante Fe Resources, and their contractor Western Geophysical comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary. If, during the course of the action, take associated with the action exceeds the Service's anticipated levels set forth under the Amount or Extent of Take, such take represents new information requiring review of the reasonable and prudent measures provided. The BLM, or their appointed representative, must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service accepts the proposed minimization and avoidance measures outlined in the project description (text and appendices), with the following revisions, clarifications, and additions.

1. The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats shall be minimized.

   a. San Joaquin kit fox natal dens shall be protected. Unoccupied natal dens shall not be destroyed without prior consent from the Service and only after all means of avoidance are exhausted.

   b. Occupied natal dens in areas of medium to high levels of prior habitat disturbance shall not be destroyed without prior consent from the Service and only after all means of avoidance are exhausted. Occupied natal dens within areas of low or no prior habitat disturbance shall not be destroyed, and shall be avoided by a minimum of 200 feet.

   c. Destruction of unavoidable kit fox dens shall follow the Service's current Standard Recommendations.

   d. Areas of potential blunt-nosed leopard lizard habitat shall be clearly marked with accompanying burrows protected to the maximum extent practicable.

   e. Giant kangaroo rat precincts showing evidence of occupation shall be avoided by a minimum of 30 feet.

   f. Giant kangaroo rat precincts not currently showing evidence of occupation shall be protected to the maximum extent practicable, and shall be destroyed only after all means of avoidance are exhausted.

   g. All appropriate and necessary measures to prevent unauthorized entry to off-road survey routes shall be implemented. BLM shall notify the Service immediately if, despite efforts to deter unauthorized use after project completion, unauthorized use continues. If such unauthorized use or road formation resulting from such use is observed to be significant, the BLM shall reinitiate consultation and the BLM, Chevron U.S.A., Inc., and Sante Fe Resources shall cooperate with the Service in correcting the situation.

2. Assist the Service in identifying the impacts of 3D Geophysical Exploration on listed species.

   a. An inventory of listed species locations collected during the pre-activity surveys and any monitoring efforts should be provided to the Service in the post-activity compliance report, with a copy to the Natural Diversity Data Base and the San Joaquin Endangered Species Recovery Planning Program.

   b. The effects of soil compaction on listed species shall be assessed by determining the extent to which these effects persist in time. This shall include determining the amount of compaction on varying soil types or topographic features and the time taken for these effected soils to return to pre-seismic compaction. In addition, the use of these compacted soils by burrowing species shall be monitored. BLM shall work with the Service in outlining a research project that will address these issues.

   c. If requested, upon completion of any activity or at any reasonable time deemed appropriate by the Service, BLM shall accompany Service personnel on site inspection tours of the sites or other locations, as requested, to review both project impacts to endangered species and their habitats, and compliance with the terms and conditions set forth in this biological opinion.

   d. BLM shall insure that Chevron U.S.A., Inc. and/or Sante Fe Resources appoint a representative who shall be the contact source for any employee who might inadvertently kill or injure a listed species or who finds a dead, injured or entrapped individual of a listed species. This representative shall be identified to the employees during the personnel training conducted by the biological monitor. The name of this representative shall be provided to the Service prior to the commencement of activities.

Reporting Requirements

BLM shall prepare and submit to the Service a brief post-project report within 45 calendar days following completion of the proposed project. This report shall include, but is not limited to: pre-project survey and monitoring results, dates that activities began and ended, a list of all personnel involved with the project who received training, a list of avoidance and take reduction measures implemented, effectiveness of such measures, amount of project area permanently or temporarily disturbed, and occurrence of incidental take of federally listed species.

Any personnel who inadvertently kills or injures a listed species or who finds a dead, injured or entrapped individual of a listed species shall immediately report the incident to the appointed representative.

   a. This representative shall contact the California Department of Fish and Game (CDFG) immediately in the case of a dead, injured or entrapped animal. The CDFG contact for immediate assistance is the Regional Office Dispatcher at 209-243-4005 ext. 151, or State Dispatch at 916-445-0045, they will contact the local warden or local biologist.

   b. The Sacramento Field Office and the CDFG shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox, blunt-nosed leopard lizard, or giant kangaroo rat during project related activities. Notification will include the date, time and location of the

incident or of the finding of a dead or injured animal, and any other pertinent information. If a dead listed animal is found, BLM will retain the carcass until receiving disposition instruction from the Service.

The Service contact is the Assistant Field Supervisor at 3310 El Camino Avenue, Suite 130, Sacramento, CA, 95821, (916) 979-2725. The CDFG contact is Ron Schlorff in the case of mammals, 1416 9th Street, Sacramento, CA, 95814, (916) 654-4262, or John Brode for reptiles and amphibians, (916) 358-2846.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Midway Valley is located between areas already identified for their biological significance and their critical importance to listed species recovery efforts: the Lokern Area is about 6 miles to the northeast; and DOE's NPR-2 is adjacent on the southeast. However, the biological resources of Midway Valley are not well documented. The Service believes that long-term management of listed species in the southern San Joaquin Valley would benefit from the data collected during and after the proposed activity. In that regard, the Service recommends the following:

1. Assemble within 4 months of the projects end, the listed and candidate species inventory data collected during project activities, and available landscape information, into a digitized format, making it available to other public agencies.

2. An evaluation of the impacts of the vibroseis exploration on the giant kangaroo rat burrows shall be conducted, if an applicable situation exists. This evaluation shall be comparable to, and the results compared with, the evaluation currently being conducted for the monitoring of the Belridge 3D seismic survey.

3. The Service recommends for future seismic projects, plant surveys for annual plants be performed during the spring when the plants are most apparent and that the furthest extent of the populations be mapped. To ensure adequate botanical surveys have been performed the Service recommends the following minimum guidelines:

   a) If a listed or proposed plant is known to occur within the same habitat and the area of the project is within the historic range of the special status plant, the botanist(s) performing the survey should: I) check nearby reference sites to observe the phenology of known populations. ii) make multiple site visits at the appropriate phenological stage during the year. Results should be documented by a written description of the reference site(s) including information on phenology and microhabitat information. Dates on which the surveys were performed should be included.

   b) The surveys should be floristic. They should not just be conducted to determine the presence or absence single rare plant species. A regional list comprised of several counties should be examined for plants occurring in the appropriate habitat. The site should also be surveyed and a complete species list provided.

Plants should be identified to the extent necessary to determine if they are rare or endangered (e.g., it is not adequate to just identify to genus, if there are any rare plants occurring in that genus).

c) A detailed description of the survey protocol used for including i) how the habitat on the site was inspected; ii) the dates the survey was performed during each of the years surveyed; iii) the reference sites, if any, that were visited; iv) the phenology of plants at the time of the survey; v) information on microhabitat information should also be included; and vi) complete species lists for the site. Detailed information should also be provided in any mitigation plan as well.

One of the goals in the recovery of listed plants in the San Joaquin Valley is to protect populations throughout the species' range, representing a variety of topographic positions and community types. Public lands will play an important role in the recovery of the listed species represented in this biological opinion. The Service would encourage BLM to participate in the recovery of San Joaquin Valley listed species by implementing the following conservation recommendations:

4. Promote surveys for presence of listed plant species on all linear projects throughout the San Joaquin Valley.

5. Unoccupied habitat within areas deemed essential to recovery should also receive a level of protection. This protection would cushion population fluctuations, encourage population expansion, and facilitate movement of pollinators and seed dispersers. The type of protection and areas to be protected should be developed with the Service.

6. Participate in reintroduction of listed species or seed collection in concert with the recovery needs of the species.

7. Assist in the monitoring of populations identified in the upcoming recovery plan.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed Midway Valley 3D Geophysical Exploration project requested on July 8, 1996. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate the cooperation of BLM, Chevron U.S.A., Inc., and Sante Fe Resources throughout this consultation process. Please contact Ms. Heather Bell of my staff at (916) 979-2728 extension 312, if you have questions or

comments on this biological opinion or further information concerning this project.

Sincerely,

Joel A. Medlin
Field Supervisor

cc: AES, Portland, OR
CDFG, Sacramento (R. Schlorff)
CDFG, Fresno, CA (J. Single)
SJVESRPP, Fresno, CA (P. Kelly)

REFERENCES

Literature Cited

Bureau of Land Management. 1993. *Eriastrum hooveri* Field Inventory. BLM, Caliente Resource Area, Bakersfield, CA. 116pp.

EASI. 1996. Endangered Species Program Naval Petroleum Reserve in California. Annual Report FY95. EG&G Energy Measurements, Las Vegas Area Operations, NV. 62pp.

EG&G Energy Measurements. 1995. Endangered Species Program Naval Petroleum Reserve in California. Annual Report FY94. EG&G Energy Measurements, Las Vegas Area Operations, NV. 59pp.

Hill, H. J. 1996. Monitoring giant kangaroo rats on the Naval Petroleum Reserves in California. Presented at Enterprise Advisory Services, Inc. NPRC Endangered Species and Cultural Resources Annual Program Review for 1995.

Hinshaw, J. M. 1996. Monitoring special status plants on the Naval Petroleum Reserves in California. Presented at Enterprise Advisory Services, Inc. NPRC Endangered Species and Cultural Resources Annual Program Review for 1995.

Otten, M. R. 1996. Monitoring of San Joaquin kit fox populations on the Naval Petroleum Reserves in California. Presented at Enterprise Advisory Services, Inc. NPRC Endangered Species and Cultural Resources Annual Program Review for 1995.

Single, J. R., D. J. Germano, and M. H. Wolfe. 1996. Decline of kangaroo rat populations during the winter of 1994-1995 in the souther San Joaquin Valley, California. Naval Petroleum Reserve Complex Endangered Species and Cultural Resources Annual Program Review, FY95. Unpubl. Rpt. 33 pp.

Skinner, M. W. And B. M. Pavlik. 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. Special Publications. Number 1, 5th Edition.

Tabor, S. P. And R. E. Thomas. 1995. Evaluation of impacts of the Belridge geophysical exploration project on small mammal burrows and the endangered plant, Kern mallow (*Eremalche kernensis*) in the Lokern Natural Area, Kern County, California. Prepared for BLM, by BioEnvironmental Associates, Bakersfield California. 15pp.

U.S. Fish and Wildlife Service. 1980. Blunt-nosed leopard lizard recovery plan. USFWS, Portland, OR. 76pp.

_____. 1983. San Joaquin kit fox recovery plan. Prepared by T.P. O'Farrell, EG&G Energy Measurements, Inc., for the USFWS, Portland, OR. 84pp.

_____. 1985. Blunt-nosed leopard lizard recovery plan revision. USFWS, Portland, OR. 85pp.

_____. 1995. Reinitiation of Formal Consultation Concerning Oil Production at Maximum Efficient Rate on Elk Hills Naval Petroleum Reserve, Kern County, California. USFWS, Sacramento, CA. 27pp.

_____. 1996. Recovery plan for arid upland and riparian species of the San Joaquin Valley, California. Preliminary draft. USFWS, Sacramento Field Office Sacramento, CA.

Personal Communications

Speigel, L. K. 1996. Personal Communication. Presentation of the California Energy Commission Research on the San Joaquin kit fox. Presented at the Western Section of the Wildlife Societies Chapter Meeting.

Cypher, E. 1996. Personal Communication. San Joaquin Valley Endangered Species Recovery Planning Program, Fresno, California.

FIGURE 1 - Location of the proposed Midway Valley 3D geophysical exploration project.

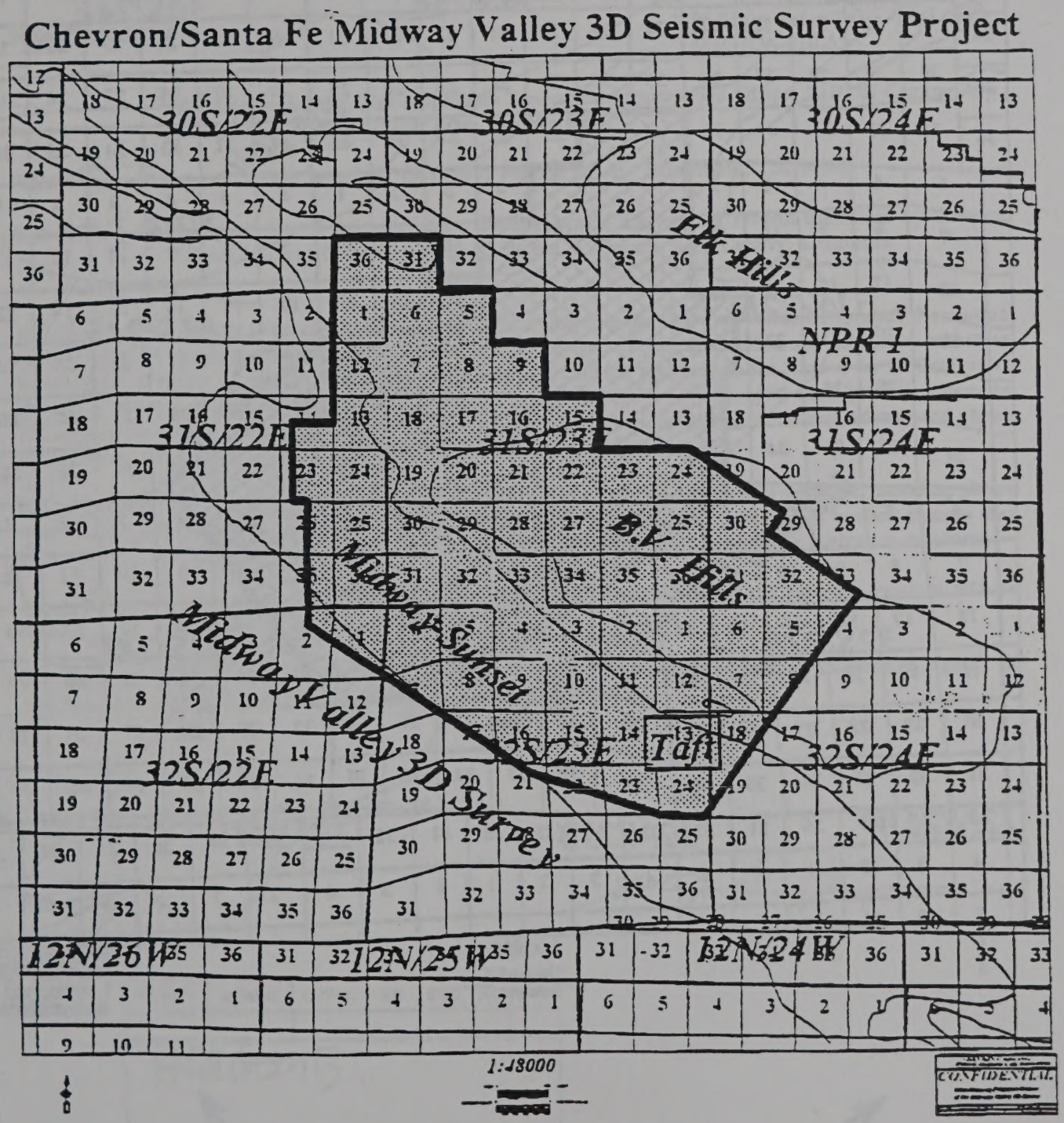
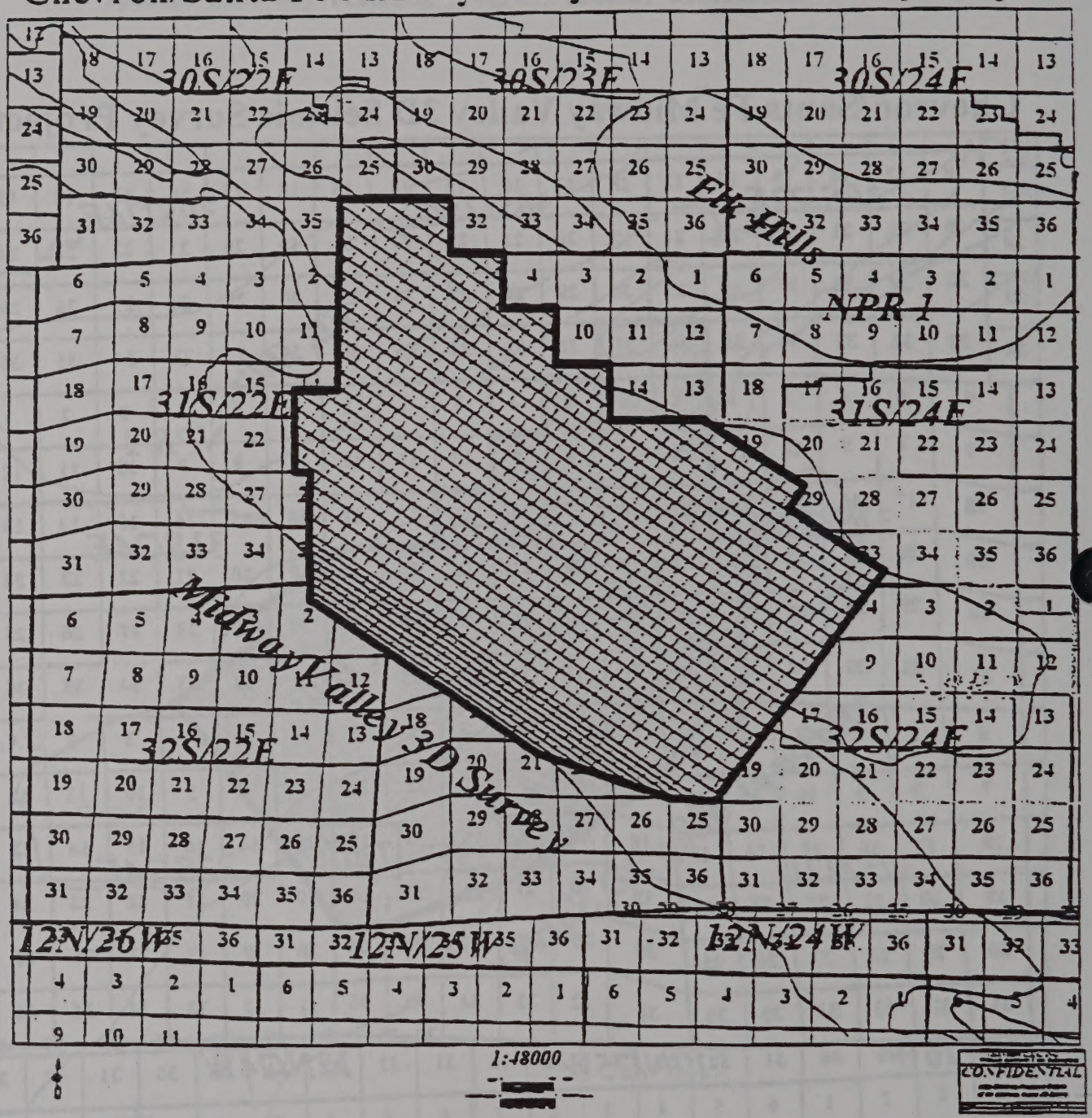


FIGURE 2 - Receiver and source line orientation for the proposed Midway Valley 3D geophysical exploration project.

Chevron/Santa Fe Midway Valley 3D Seismic Survey Project



APPENDIX A - BLM Memorandum and updated project description and biological evaluation.

BUREAU OF LAND MANAGEMENT
CALIENTE RESOURCE AREA

RECEIVED
NOV 04 1996
ECOLOGICAL SERVICES
SACRAMENTO FIELD OFFICE

OCT 31 1996

MEMORANDUM

In Reply Refer To:
6840 (CA-010.3)

TO: Field Supervisor, U.S. Fish and Wildlife Service, Sacramento Field Office, 3310 El Camino Ave. Sacramento, CA 95821-6340 Attn. Heather Bell

FROM: Area Manager, Caliente Resource Area, 3801 Pegasus Drive, Bakersfield, CA 93308

SUBJECT: Documentation for Midway Valley 3D Geophysical Exploration Project conducted by Chevron U.S.A., Inc. and Sante Fe Energy Resources in Western Kern County, California.

In response to your request to provide documentation of the changes in the Midway Valley 3D project description since we initiated Formal Section 7 Consultation, attached is the final project description and mitigation measures for the Midway Valley 3D project. This is the description that Chevron provided to the Bureau on 18 October as part of the NEPA document being prepared by the consultant and the BLM. This project description incorporates all the changes that have been provided to the Service through the various pieces of correspondence and phone conversations between the Service, Chevron and the Bureau.

We are providing you with this project description for your files to supersede all previous versions, including phone conversations and associated correspondence. We have not keep detailed documentation of all project changes that Chevron has made through their initiative or as a result of discussions about appropriate mitigation measures.

We hope that this documentation will fulfill your request since reconstruction of the previous events would be difficult.

We will be sending you a copy of the NEPA document for your files when the Record of Decision is signed. If you have any questions, please contact Larry Saslaw at (805) 391-6086.

Stephen Fan

FS/DFS	ADMIN	CVPIA	EC	ESD	HC	WR

Heather B.

INTRODUCTION

The proposed Midway Valley 3D Geophysical Exploration Project covers approximately 31,444 acres of private lands, 6,880 acres of Department of Energy Lands within NPR2 and 3,840 acres of lands administered by the Bureau of Land Management, in western Kern County, California. A Biological Opinion for the proposed project has been rendered by the Acting Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, Sacramento Field Office in Formal Section 7 Consultation with the Area Manager, Caliente Resource Area, U.S. Bureau of Land Management, Bakersfield, CA.

This environmental assessment presents an overview of the affected environment within the project area using results of a literature review of biological field surveys previously conducted within or adjacent to a proposed 3D seismic project. The purpose is to provide background information to identify potential and known locations of sensitive wildlife and special status plant species within the proposed seismic project area. Biological field surveys, following agency approved survey protocols, will be conducted during October through November 1996 to acquire current resource data to provide avoidance as the project is being implemented in the field.

The Midway Valley 3-D seismic project area is located in western Kern County, California. The approximately 66 square mile project area is bounded by the community of Derby Acres on its west-central border. The prospect includes the city of Taft along the southern boarder ranging north through the Buena Vista hills (NPR2) and northward across the Buena Vista Valley to the southern boundary of NPR1 (Elk Hills). The topography of the study area is generally flat from east to west, but rises into the Buena Vista Hills at its center.

Chevron U.S.A., Inc. and Santa Fe Energy Resources (Chevron/Santa Fe Energy) are proposing to conduct seismic investigations just southeast of the city of McKittrick and Derby Acres and in the Buena Vista and Midway Valleys, Kern County, California (Figure 1). Chevron/Santa Fe Energy's geophysical contractor will be Western Geophysical Corporation (Western Geophysical). In general, proposed seismic testing includes vibroseis using six truck equipped vibroseis units. All project related activities will be contained to existing roads and trails; cross country travel will occur only where roads and trails are not available, where sensitive resources can be avoided within the seismic corridors by vehicles, or where no listed resources occur within agency avoidance criteria within the 100 ft seismic corridor. Recording cables, geophones, and related equipment will be positioned over the project site while the project is in process.

Because the project is located in areas that may have potential to support populations of threatened and endangered species a biological survey is necessary to meet criteria of the federal endangered species act (ESA) of 1976 as amended, and the California endangered species act (CESA). The biological survey and assessment are conducted to assess potential impacts of project related activities to threatened and endangered plant and animal species and to provide mitigation to lessen impacts to listed species and their habitat(s).

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

Chevron/Santa Fe Energy have proposed to conduct seismic investigations to obtain information about potential oil and gas deposits in the Midway Valley Area.

The proposed action requires the authorization from BLM and DOE for portions of the geophysical operation on federal lands (3,840 acres of BLM lands and 6,880 acres of DOE lands located within NPR2). Permits for land use and geophysical operation crossing were obtained by the seismic contractor for Chevron/Santa Fe prior to project related field operations.

Given that Chevron and Santa Fe are two of the largest oil field operators/land holders in the Midway Valley area, their joint approach to evaluation of acreage with 3D seismic data likely will result in a reduction in the number of future, separate, geophysical operations in the area. Hence, long-term impacts to listed species and their habitat will be minimized.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 NO-ACTION

Under the no-action alternative, the BLM and DOE would not allow seismic operations to be conducted on BLM and NPR-2 lands. Therefore the seismic project would be reduced in mineral and surface data acquistion.

2.2 PROPOSED ACTION

The project is proposed in three stages. Phase 1 will consist of five to six 2-man survey teams deploying temporary pin flags along the source and receiver lines. Agency approved biologists and archeologists will follow the surveyors and flag all areas where surface disturbing activities may affect listed wildlife and cultural resources. The biologists and archeologists will recommend minor re-routes so that project vehicles can adhere to agency approved avoidance criteria for listed biological and cultural resources.

Phase 2 will consist of placement of geophones and data collection. Light-weight, four- wheel, all-terrain vehicles (ATVs) and four-wheel drive trucks will be used to transport, deploy, and pick up the recording equipment. Geophone trucks will be used for geophone deployment and retrieval. This action is proposed along the same geophone lines that the vibrator trucks will follow. ATVs will be used for all additional travel to service and repair recording equipment at all off-road locations. In some cases, deployment of recording equipment would be completed by hand. Six truck mounted vibroseis units spaced 2-5 ft apart will proceed in single file along source lines generating seismic energy near the 8,426 source points. The lead vibrator truck will stop one truck length past the source point, all trucks will lower their pads and vibrate for 18 sec before moving forward approximately 7.5 ft to repeat the process. Each truck will lower its pad and vibrate 12 times at each source point. The collective vibrator pad depression at each source point has the potential to be 0-6 inches deep, 7 ft wide, and 165 ft long. After completing

vibroseis at all eight points along a source line segment. vibrator trucks will travel on the perpendicular geophone line for 1320 ft to reach the next set of eight source points and begin vibrating. The pads on the units are 7.25 ft. wide and 3.0 ft. long. All project vehicles, excluding vibrator trucks and vehicles deploying geophones, will be confined to existing roads except where practical. Phase 1 and Phase 2 would require a total of approximately 120 days to complete. The project is scheduled to begin in November of 1996 and should be completed by late February 1997.

Phase 3, project reclamation, will proceed concurrently with the completion of Phase 2 activities. All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications. BLM and DOE standard mitigation measures shall apply and are included as Appendix A.

2.3 ALTERNATIVES ELIMINATED FROM CONSIDERATION

Alternative locations to the proposed geophysical operation were considered during initial site selection. Such alternatives would require a request for larger surface area or a different seismic testing approach (large drilling trucks) thereby creating equal or greater potential impacts to endangered species habitat and cultural resources. The proponents decided not to pursure these options; further analysis was therefore dropped.

Chevron/Santa Fe could confine the project scope to private lands. Under this alternative, Chevron would be required to obtain a Section 10a permit from the U.S. Fish and Wildlife Service as required by the Endangered Species Act of 1973, as amended. Impacts from the private lands alternative would be much the same as those for the proposed project except that they would not involve public land. The no-action alternative could increase the likelihood of future, individual seismic projects within the Midway Valley area. The tangible and intangible benefits of evaluating the resource potential of public lands would also not be realized.

3.0 AFFECTED ENVIRONMENT

3.1 PROPOSED ACTION

3.1.1 AIR QUALITY

Air quality in the Kern County region is considered marginal, with the San Joaquin Valley Air Basin being designated as a non-attainment area for two of the six criteria air pollutants (ozone and PM-10 [particulate matter less than 10 microns]) for which National Ambient Air Quality Standards (NAAQS) have been established. All DOE activities are governed by an extensive air pollutant permitting and monitoring program operated by the San Joaquin Valley Unified Air Pollution Control District.

PROPOSED MITIGATION MEASURES

All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications.

A. Vibroseis avoidance criteria for off-road locations:

- 200 feet from occupied San Joaquin kit fox natal dens;
- 150 feet from known San Joaquin kit fox natal dens;
- 100 feet from occupied San Joaquin kit fox dens;
- 100 feet from known San Joaquin kit fox dens;
- 50 feet from potential San Joaquin kit fox dens;
- 20 ~~50~~ feet from giant kangaroo rat burrow systems;
- 30 feet from burrows where San Joaquin antelope squirrel burrows;
- 30 feet from occupied blunt-nosed leopard lizard burrows;
- 30 feet from badger dens;
- 30 feet from burrowing owl burrows;

B. Access route avoidance criterion for off-road vehicle travel:

- No sensitive wildlife resources within a 50-foot corridor along access routes and receiver lines.

C. The seismic contractor shall test to determine when vehicles can commence activity after the area receives measurable rainfall. The result of soil compaction is a decrease in volume. This decrease can be quantified by measuring the depth of the depression left by the compacting instrument. During the first day of seismic testing, with soil in a dry condition, the project biologist will measure the depth of tire tracks and all vibroseis pad depressions at 20 source points. After measurable rainfall, when surface soils are no longer in a saturated condition, the biologist will measure tire and all vibrator pad depressions at the first source point of the day. If depth measurements of tire tracks and vibroseis pad depressions are more than 75% greater than average measurement taken in dry soil, all off-road vehicle travel will be suspended until conditions improve.

D. Geophones will be placed on BLM lands in the following manner:

1) All vehicles will avoid driving on areas of cryptogamic soils.

2) The geophones will be walked across cryptogamic soils and areas identified as having high densities of listed plants and deployed by hand in the field.

3) If necessary, biological monitors will be on-site during geophone placement to identify sensitive areas to avoid.

4) Selected geophone lines may be marked on BLM lands to provide line location for post-project monitoring.

E. All source points in areas, on BLM lands, that are found to have high densities of listed plants will be relocated.

F. No off-road vehicle travel (except by ATVs) in areas found to have any densities of listed plants. Vibrator trucks will follow flagged routes around areas of listed plants on BLM lands. A 50 foot avoidance zone for Hoover's wooly star will be enforced.

G. To minimize the potential for incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat (some of the measures have been modified to reflect the current proposed seismic methodology):

1) The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats should be minimized.

2) The potential for inadvertent entrapment of San Joaquin kit foxes, blunt-nosed leopard lizards and giant kangaroo rats in dens and burrows should be minimized.

3) The extent of off-road survey routes and other seismic testing areas should be minimized.

4) The potential for unauthorized vehicle use of off-road survey routes should be minimized.

H. The seismic contractor should provide compliance with the following terms and conditions, which implement the reasonable and prudent measures described above:

1) The potential for harm or mortality to listed wildlife species and their habitats should be minimized by implementing the following procedures:

a) All measures as proposed by USFWS (1996) for the Chevron/Santa Fe Midway Valley 3D seismic project should be followed. Mitigation below incorporates such

measures requirements of the proposed Midway Valley 3D seismic project.

b) Prior to the onset of ground-disturbing project activities, a qualified wildlife biologist should brief all project personnel on the occurrence and distribution of listed species in the project area, measures being implemented to protect these species during project actions, reporting requirements should incidental take occur, and applicable definitions and prohibitions under the Act.

c) Within 4 weeks prior to commencement of seismic testing activities, a qualified biologist(s) should conduct preactivity surveys of proposed vibrator and geophone travel paths. During pre-activity surveys, the status of previous surveys should be reviewed; San Joaquin kit fox dens and kangaroo rat and leopard lizard burrows should be flagged for avoidance, as necessary; and additional habitat features, if any, should be identified and flagged as necessary.

d) Biological monitors should accompany seismic survey vehicles and crews throughout the project area at all times that activities with the potential to affect listed species are being conducted. Biological monitors may conduct preactivity surveys as described above; should aid seismic crews in satisfying avoidance criteria and implementing project mitigation as described in this evaluation; should aid seismic crews in relocating shot and geophone lines as necessary; should observe and note all pertinent information concerning project effects on listed species; and in general should assist the seismic contractor in conducting the proposed project in such a manner as to minimize adverse effects on endangered and threatened species. At least one biological monitor should accompany the vibrator crew working within endangered species habitat.

e) Pets should not be permitted on the project site during project activities.

f) All food-related trash such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers only and regularly removed from the project site.

g) All spills of hazardous materials within endangered species habitats should be cleaned up immediately per SPCC plans.

h) Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset.

i) All project-related vehicles should observe a speed limit of 20 mph or less on all routes that traverse endangered species habitat, except on State and County highways and road.

j) Within 45 calendar days after completion of the project, the seismic contractor should submit to the Service and the BLM a post-activity compliance report that details the following information: dates that seismic testing occurred; pertinent data concerning the seismic contractor's success in meeting project mitigation measures, if any; known project effects on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats, if any (including specific number of dens and small mammal burrows damaged or destroyed); occurrences of incidental take of federally listed species, if any; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats, a summary of rehabilitation plans, if any; and other pertinent information.

2) All known and potential San Joaquin kit foxes dens, giant kangaroo rat burrows, and burrows potentially inhabited by blunt-nosed leopard lizards should be protected by implementing the following procedures. Such protection will help prevent incidental take of dens and burrows in excess of the take limits described above.

a) All project vehicles should observe travel avoidance routes describe in the biological preactivity survey notes that provide avoidance for sensitive wildlife and special status plant resources, unless alterations to these routes are expressly allowed by the biological monitors.

b) To minimize effects of geophone deployment, the applicant should utilize approved travel corridors along geophone lines to deploy all off-road geophone lines that occur within endangered species habitat. No vehicles other than geophone deployment vehicles should be used to deploy geophones in such areas. During geophone deployment, work crews should make every reasonable effort to avoid sensitive habitat areas such as dens, burrows, and cryptogamic crusts. To the maximum extent practicable, geophone vehicle operators should avoid such habitat areas by 10 feet. One biological monitor exclusive of monitors observing vibrator crew activities should oversee the activities of geophone line deployment crews.

c) All avoidable San Joaquin kit fox dens and kangaroo rat and blunt-nosed leopard lizard burrows within the immediate vicinity of survey routes should be prominently staked and/or flagged as necessary to alert project personnel to their presence. All project-related flagging should be collected and removed after completion of the project.

d) The applicant should make every reasonable effort to prevent the collapse of dens and burrows by relocating source points to avoid dens and burrows or other means as determined to be appropriate.

e) Project biological monitors should keep an accurate and running tally of the number

of dens and burrows damages, destroyed, or otherwise affected by project activities. Such tallies should be combined and totaled at the end of each work day to determine proximity to take limits and the need for subsequent project modifications to prevent den and burrow effects in excess of take limits. Total number of dens and burrows affected by the project should be reported in the post-activity compliance report.

f) If damage or destruction to a known San Joaquin kit fox den cannot be avoided during project activities, the BLM, DOE, and USFWS should be contacted immediately for guidance. Potential kit fox dens that cannot be avoided during project activities may be excavated and backfilled pursuant to Service guidelines without prior notification, provided that excavation is approved and supervised by a project biological monitor and that such excavation is within incidental take limits provided in the projects biological opinion. Destruction of all kit fox dens shall be reported in the post-activity compliance report.

3) The extent of off-road survey routes and other seismic testing areas should be minimized by implementing the following procedures:

a) Where seismic lines cross threatened or endangered species habitat, the survey corridor within which testing and ancillary vehicles operate should be limited to a maximum width of 50 feet (25 feet on either side of the center line). These testing activity zones should be reduced, where possible, to avoid endangered species sites such as occupied kit fox dens or kangaroo rat burrows.

b) Project related vehicles should be confined to existing primary or secondary roads or to specifically delineated project areas (i.e., areas that have been surveyed and described in existing documentation). Otherwise, no off-road vehicle travel should be permitted.

1) Unauthorized vehicle use of off-road survey routes should be minimized by implementing appropriate measures to prevent unauthorized entry to off-road survey routes, including placement of gates or fences where these routes intersect existing roads, and posting of signs stating that access is not permitted.

I. The following general and specific measures should be implemented to avoid potential adverse impacts to candidate and California species of special concern and their habitats:

San Joaquin Antelope Squirrel - Impacts can be avoided by staying to the flagged route and avoiding the burrows as marked in the field. In addition, a biologist is recommended to assist project related vibroseis and geophone truck cross country travel so as avoid sensitive resources (burrows) and their habitat(s).

Blunt-nosed leopard lizard - The project area is within the known range of blunt-nosed leopard lizards. Project impacts to blunt-nosed leopard lizard habitat could result from habitat being temporarily destroyed (crushed shrubs and vegetation that serve as loafing cover). This type of impact may be lessened by having a flagged route that vehicles should follow through areas of low density shrubs and other vegetation. Shrubs and burrows should be avoided to reduce impacts to over-wintering blunt-nosed leopard lizards.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November-February). Project activities will be conducted during daylight hours when lizard activity is optimum. Impacts to this species could result from lizards being crushed by vehicle traffic. In addition, vibration induced collapse of burrows is a low impact potential if avoidance criteria are complied with. Blunt-nosed leopard lizard impacts will be minimized using the following measures:

a. Check surrounding land uses and disturbance for suitable leopard lizard habitat, and
b. Check percent slope, and
c. Check vegetation density, and
d. Check availability of burrows for refuge

Loggerhead Shrike - Loss of foraging and nesting habitat for the Shrike may result if large shrubs with nests are driven over. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Le Conte's Thrasher - Loss of potential foraging and nesting habitat for Le Conte's thrashers may result if shrubs with nests are driven over. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Burrowing Owl - Loss of foraging and nesting habitat for burrowing owls may result as the seismic travel corridor is being used. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Short-eared Owl - This species can fly out of imminent danger, though nesting areas remain vulnerable to seismic travel corridors. Preactivity surveys should include a thorough inspection of the proposed seismic travel corridor and proposed access travel paths to ensure that nests of this species are not destroyed. Young owls are especially vulnerable to collisions with vehicles, particularly during foraging bouts. Increased disturbance and mortality would lower breeding success, and may cause the owls to abandon the site. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related

APPENDIX C

STATE HISTORIC PRESERVATION OFFICE CONSULTATION AND ARCHEOLOGICAL ASSESSMENT

BUREAU OF LAND MANAGEMENT
DECISION RECORD
FOR EA NO. CA-016-97-009

Recommendation: It is recommended that a geophysical permit be granted to Chevron U.S.A. and Santa Fe Energy Resources Inc. by the Bureau of Land Management and the Department of Energy to authorize the seismic operation to be undertaken on public land. The geophysical permit should be granted under the provisions of Title V of the Federal Land Policy and Management Act of 1976 (90 Stat 2743; 43 USC 1701). The geophysical permit should be made subject to the terms and conditions of 43 CFR 2800 and the mitigation measures set forth in the environmental assessment (included as **EXHIBIT B, USFW Biological Opinion**). The land is legally described as follows:

All or portions of the following sections:
36-30S/22E
1, 12, 13, 14, 23, 24, 25, 26, 35, 36-31S/22E
1, 2-32S/22E
31-30S/23E
5, 6, 7, 8, 9, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36-31S/23E
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24-32S/23E
19, 20, 29, 30, 31, 32, 33-31S/24E
4, 5, 6, 7, 8, 17, 18, 19-32S/24E
Note: Project is located in Kern County, California

QUAD NAMES (7.5 min): Taft, West Elk Hills, and Fellows 7.5 min USGS quad maps, 1:100,000 surface management map

AFFECTED SURFACE AREA: 39,145 acres

Public Acres: 10,720 acres
Private Acres: 28,425 acres

The proposed project includes 34 lines (295 miles) of geophone and associated receiving cable and 52 source lines (263 miles) (Figure 2). Potential impacted acres from vibroseis compaction totals 231 acres. However, up to 20% of the source points will not be impacted by vibrator pad compaction. This could result in 185 actual acres of impact (231 total acres x 80% = 185 acres actually disturbed).

The environmental assessment identified that all cultural resources would be avoided by ground disturbing activities and therefore the project will result in no effect to cultural resources or any National Register eligible or listed properties. Although the consultation period has not elapsed with the SHPO, we anticipate a concurrence of no effect to cultural resources per previous verbal discussions with the SHPO staff. We anticipate a formal written response from the SHPO between November 18 - 25, 1996. The proponents shall refrain from seismic testing on federal lands until the SHPO reviews the action. Should the SHPO not concur with the finding of no effect the proponents will abide by any additional measures identified by the SHPO.

The proposed seismic project is located/shall be located as shown in Figures 1 and 2 and on the attached EXHIBIT A.

The geophysical permit shall be granted for a term of 120 days with the right of renewal.

BUREAU OF LAND MANAGEMENT
DECISION RECORD
EA NO. CA-016-97-009

Finding of No Significant Impact: We have reviewed the environmental document, which analyzes the environmental effects of the proposed action, and have determined that the proposed action and recommended mitigation measures result in a finding of no significant impact on the human environment. We find that proper consideration has been given to all resource values and that this assessment is technically adequate. Therefore, an environmental impact statement is not required to further analyze the environmental effects of the proposed action.

Russ Lewis — 11/15/96

Project Lead, Caliente Resource Area — Date

Stephen Larson — 11/15/96

Chief, Branch of Resources, Caliente Resource Area — Date

Decision: It is my decision to approve the proposed action for the Midway Valley 3D Seismic Project, subject to the mitigation measures identified for the proposed action in the Environmental Assessment. The Decision Record incorporates the mitigation measures and recommendations into the proposed action as the decision of the bureau on this matter.

Rationale: I have reviewed the recommendations on the proposed action addressed in the Midway Valley 3D Seismic Project environmental assessment. I find this action to be in conformance with applicable land use plans, that it effectively serves the public, that it does not constitute a major federal action or result in significant impacts, and that it will not cause unnecessary or undue degradation. The decision to allow the proposed action is fully consistent with the land use plan for this area.

Stephen Larson — 11/15/96

Authorized Officer, Caliente Resource Area — Date

APPENDIX F

SUPPLEMENTAL CORRESPONDENCE

(OIL SPILLS ON THE PROJECT SITE)

(PROJECT TIME-LINE EXTENSION AND SOIL MOISTURE MODIFICATIONS REQUEST LETTER)

(IMPORTANT DATES DURING PROJECT)

(ENDANGERED SPECIES EDUCATION COURSE SIGNATURE SHEET)

(LETTER TO USFWS CONCERNING OBSERVED INJURED WILDLIFE WITHIN THE PROJECT SITE - NON PROJECT RELATED)

Bio Environmental Associates

Stephen P. Tabor, M.S.
TWS - Certified Wildlife Biologist

837 Arbor Ave., Suite A
Fort Collins, Colorado 80526
(970) 207-0575

24 February 1997

Larry Saslaw
U.S. Bureau of Land Management
3801 Pegasus Drive
Bakersfield, California 93308

RE: Evaluation of an Oil Spill within the Chevron and Santa Fe Energy Resources, Inc. Midway 3D Seismic Project

Dear Mr. Saslaw:

Enclosed is a copy of the survey and assessment that Kristie Hammer conducted in response to an oil spill that occurred within the Chevron and Santa Fe Energy Resources, Inc. Midway 3D Seismic Project. The location of the spill was along source line 5091 at source point 5143 which is located in NE 1/4 of the SW 1/4 of Section 36, T31S R23E (36B), immediately adjacent (east) of Chevron's Oil Gauging and Cleaning Plant located north of Midway Road and west of Highway 119. This area is characterized by moderate oilfield development. The assessment is provided on the attached pages.

Thank you for your time and attention to this matter. If you have any questions please call us at (970) 484-4467 or at (970) 207-0575. In addition, please feel free to contact Kristie Hammer at the project site regarding this issue.

Sincerely,

Stephen P. Tabor

Stephen P. Tabor
TWS - Certified Wildlife Biologist

cc: Roslyn Muller, Chevron
John Beery, Chevron
John Krull, Western Geophysical
Russ Gentry, Western Geophysical
Joe Broussard, Western Geophysical

RE: Evaluation of Oil Spill along Source Line 5091 at Source Point 5143

On 10 February 1997 Scott Weathington, of Western Geophysical, contacted me in the field and requested a biological assessment of an oil spill at source point 5091 5143, which may have occurred as a result of vibroseis activities conducted at the location the previous day. On 09 February, approximately 4 pm, a tire on one of the vibrators apparently struck a control valve on a 4 inch flowline snapping it off. This resulted in deposition of oil on the site when the line was pressurized. I evaluated the site at approximately 10 am on 10 February, following spill control actions by Chevron and after clean-up operations had been initiated. A characterization of the spill and the effects to plants and wildlife is summarized below for your review.

Characterization of Spill

The location of the spill was along source line 5091 at source point 5143, which is located in the NE 1/4 of the SW 1/4 of Section 36, T31S R23E (36B), immediately adjacent (east) of Chevron's Oil Gauging and Cleaning Plant located north of Midway Road and west of Highway 119. The area is characterized by moderate oilfield development.

Oil that was discharged from the flow line, and the subsequent surface modification (scraping) during clean-up, affected an area of approximately 0.25 acres. Roughly the configuration of an irregular "eight", dimensions of the affected area measured approximately 200 feet from north to south. The spill site measures east to west; 90 feet across the northern portion of the site, 38 feet across the southern portion of the site, and 30 feet across the central portion of the site. Spray from the source, which was located in the southwest, deposited oil primarily across the north and northeast portions of the affected area forming large pools. When I surveyed the site, some of the affected area had already been scraped and a large trench had been dug in the northeast portion to contain the oil. Piles of contaminated soil and vegetation in several places on the site had not yet been removed.

Effects to Plants and Wildlife

The site is located in disturbed saltbush scrub habitat with *Atriplex polycarpa* the dominant shrub species. Herbaceous cover at the site is dominated by *Bromus madritensis* ssp. *rubens* (red brome) and *Erodium cicutarium* (red-stemmed filaree). Disturbed species including *Salsola tragus* (tumbleweed) and *Centaurea melitensis* (star thistle) also are present on the site.

Roads and/or turnout areas border the site on the north, west and south. A disturbed wash which previously had been asphalted by oilfield activities and which contains the remains of an abandoned well cellar structure exists along the eastern portion of the site. In addition, numerous pipelines run adjacent to the affected area, including the 4 inch line and another 8 inch line along the western boundary of the site, and an 8 inch and 2 inch line to the east. Most of the habitat occurs as disturbed roadside vegetation and marginal fragmented areas within the affected area.

The most direct effect to plants occurred when the habitat was scraped to remove heavily contaminated soils and vegetation. There were no effects to listed plants as a result of the spill. Hoover's wooly-star is known to occur in disturbed habitats within the project area. However, surveys of the affected area prior to vibroseis testing did not locate any individuals of this species.

During a survey of the affected area, no observations of dead or oiled animals were found. Though scraping and clean-up activities had commenced before I arrived on the site, it is unlikely that any oil-related mortalities went undetected, primarily due to the disturbed condition of the site and relatively small size of the affected area, and the lack of burrows, dens, or other activity.

Surveys of the affected area prior to vibroseis activities found no evidence of threatened and endangered wildlife species. The spill site has potential to support San Joaquin kit foxes but no dens were located during surveys and habitat is marginal for this species. Though the area is within the known range of blunt-nosed leopard lizards and giant kangaroo rats, potential habitat does not exist for these species at the spill site. One potential antelope ground squirrel burrow was recorded during the survey phase of the project, however resource flagging was removed when it was found to be occluded prior to vibroseis occurring at the site.

I will continue to monitor the site as clean-up progresses and keep you appraised of any significant events pertaining to the effects of the spill.

Thank you for your time and attention to this matter. If you have any questions please feel free to contact me at the project site regarding this issue.

Sincerely,

Kristie L. Hammer

For: BioEnvironmental Associates

Bio Environmental Associates

Stephen P. Tabor, M.S.
TWS - Certified Wildlife Biologist

837 Arbor Ave., Suite A
Fort Collins, Colorado 80526
(970) 207-0575

30 April 1997

Larry Saslaw
U.S. Bureau of Land Management
3801 Pegasus Drive
Bakersfield, California 93308

RE: Evaluation of an Oil Spill within the Chevron and Santa Fe Energy Resources, Inc. Midway 3D Seismic Project (Along Source Line 5285 at Source Point 5066)

Dear Mr. Saslaw:

Enclosed are the results of our survey and assessment of an oil spill that occurred within the Chevron and Santa Fe Energy Resources, Inc. Midway 3D Seismic Project. This area is characterized by moderate oilfield development. Results of our survey and assessment are provided below.

On 12 April 1997 while monitoring vibroseis truck movement, one of the trucks broke a check valve on an above ground pipeline. The valve was not protected by any type of welded guard frame. Pipeline companies usually placed protection frames around valves of this type on pipelines in the local area. We met Randy Shannon and Mike Warrington of Western Geophysical at the spill site (approximately 5 minutes after the spill was reported) and conducted an emergency biological survey and assessment of the oil spill at source point 5285 5066. On 12 April 1997, at approximately 3 pm, a tire on one of the vibroseis trucks apparently struck a control valve on an approximate 10 inch flowline snapping it off. This resulted in deposition of oil on the site when the valve was snapped off. The line was pressurized. We evaluated the site at approximately 3 pm on 12 April 1997, and we implemented spill control actions with staff of Western Geophysical immediately. Clean-up operations were implemented by Texaco staff and contractors at approximately 6:30 pm on 12 April 1997 and during the following day. The clean-up crew commented that the valve was not properly protected by a welded frame guard that is placed around the valve for protection. A characterization of the spill and the effects to plants and wildlife is summarized below for your review.

Characterization of Spill

The location of the spill was along source line 5285 at source point 5066, which is located in the NW 1/4 of the NW 1/4 of Section 25, T31S R23E, near the corner of Shale Road and an unnamed dirt oilfield access road in the Midway Oilfield. The pipeline belongs to Texaco. The general area is characterized by moderate oilfield development.

Oil that was discharged from the flow line, and the subsequent surface modification (scraping) during clean-up, affected an area of approximately 0.10 acres. Roughly oval in shape, dimensions of the affected area measured approximately 150 feet from north to south. The spill site measures east to west; 60 feet across the center of the spill at its widest point. Spray from the source, which was located from the origin of the spill to approximately 150 south of the origin was reduced by placing a tire over the broken valve. This reduced the amount of oil spray (the wind was blowing from the north approximately 5-10 mph). The area where oil spray and flow was deposited was an area that previously was graded and denuded of most vegetation. After the tire was placed on the broken valve a small pool of oil formed on the north side of the pipeline. This area was also previously graded and denuded most of vegetation. In addition, we dug a trench around the pool of oil and established berms of soil to contain and limit the spill. Piles of contaminated soil (from the berms and within the spray zone) and small amounts of vegetation in several places on the site were removed the evening of 12 April 1997 and during the following day.

Effects to Plants and Wildlife

The spill site is located in a previously graded site that had small amounts of non-native grassland and valley saltbush community species. One *Atriplex polycarpa* shrub was located next to the broken valve. Herbaceous cover at the site is dominated by *Bromus madritensis* ssp. *rubens* (red brome) and *Erodium cicutarium* (red-stemmed filaree). Disturbed species including *Salsola tragus* (tumbleweed) and *Centaurea melitensis* (star thistle) also are present on the site.

Roads and/or turnout areas border the site on the north, east and south. Suitable habitat for denning sites for kit foxes is located approximately 225 ft south of the broken valve and approximately 60 ft south of the southern edge of the spray zone. In addition, numerous pipelines are located adjacent to the affected area and other types of oilfield developments (i.e. pumping units, etc.) are adjacent to the site. Most of the habitat occurs as disturbed roadside vegetation and marginal fragmented areas within the affected area.

The most direct effect to plants occurred when the habitat was scraped to remove contaminated soils and vegetation. There were no effects to listed plants as a result of the spill. Hoover's wooly-star is known to occur in disturbed habitats within the project area. However, surveys of the affected area prior to vibroseis testing did not locate any individuals of this species.

During a survey of the affected area, no observations of dead or oiled animals were found the day of the spill. On 13 April 1997, we recovered a Loggerhead Shrike that was mired in the spill. The shrike was beyond recovery and was killed humanely. We did not observe any additional mortalities from the spill scraping and clean-up activities. It is unlikely that any oil-related mortalities went undetected, primarily due to the disturbed condition of the site and relatively small size of the affected area, and the lack of burrows, dens, or other activity.

Surveys of the affected area prior to vibroseis activities found no evidence of threatened and endangered wildlife species. The spill site has no potential to support San Joaquin kit foxes (for denning sites) and no dens were located during surveys. Habitat is marginal for this species.

Though the area is within the known range of blunt-nosed leopard lizards and giant kangaroo rats, potential habitat does not exist for these species at the spill site. We observed one Heermann's kangaroo rat sized burrow on a west facing slope of the disturbed site. The burrow was located approximately 30 feet west of the spray zone. We continued to monitor the site until clean-up was completed.

Thank you for your time and attention to this matter. If you have any questions please call us at (970) 407-0654 extension 4741 or at (970) 207-0575.

Sincerely,

Stephen P. Tabor

Stephen P. Tabor
TWS - Certified Wildlife Biologist

cc: Roslyn Muller, Chevron
John Beery, Chevron
Mike Warrington, Western Geophysical
Randy Shannon, Western Geophysical
John Krull, Western Geophysical
Russ Gentry, Western Geophysical
Joe Broussard, Western Geophysical

BUREAU OF LAND MANAGEMENT
CALIENTE RESOURCE AREA
3801 PEGASUS DRIVE, BAKERSFIELD, CA 93308
(805) 391-6000

MEMORANDUM **In Reply Refer To: 6840**

TO: Heather Bell, Wildlife Biologist, US Fish and Wildlife Service, Sacramento Field Office,

FROM: Larry Saslaw, Wildlife Biologist

SUBJECT: Midway 3-D Seismic

The wet weather that occurred in December and January and vandalism to the geophone lines in the Taft segment of the project resulted in several "no work" days on the 3-D project. It is now anticipated that the project activities will continue beyond the original completion date of February 31, 1997. In a meeting between Chevron, Western Geophysical, BLM, and the project consulting biologists on January 31, two issues related to project scheduling and the Section 7 authorization were discussed:

1) The project schedule had slipped due to the wet weather and vandalism to require an additional month to complete the project. Thus, the completion date is projected for the end of March, rather than the end of February.

2) There was consensus that if the project could relax the wet weather constraints in the less biologically sensitive areas (near Taft, the oil fields, and Midway Valley) the project could proceed through and complete the Buena Vista Valley before the San Joaquin kit fox pupping season. In order to do this, new constraints would be proposed by the project biologists that would remediate soil/vegetation impacts of the vehicle travel in wet soil conditions.

The project biologists and BLM propose that the current wet weather criteria be amended in the following manner:

1) The soil moisture and compaction criteria be modified to allow vibroseis to occur above the 75% level in areas where significant impacts to sensitive biological resources and their habitats would not occur and in areas where significant erosion

would not occur. Each vibroseis line will be inspected for compaction on a case by case basis. In areas where there are no sensitive biological resources or threats of serious erosion, vibroseis could be conducted and tire and pad imprints recontoured and filled as necessary to satisfactorily mitigate the impacts to soil and vegetation.

2) Monitors will continue to measure and record tire and vibroseis pad depression depths and will make decisions based on microhabitat, topography, presence and density of sensitive resources with regard to cross country vehicle travel that may occur when the project site has received measurable rainfall. Cross country vehicle travel will be curtailed when soils are saturated and such vehicle travel could not be satisfactorily mitigated by recontouring and filling.

These measures will allow the project to proceed on a schedule that will minimize impacts in the most sensitive areas of Buena Vista Valley where more biological resources are located. Of greatest concern is the avoidance of San Joaquin kit fox pupping activities that may be affected if the project activities were to occur after mid-March. With these modifications, the project would complete the Buena Vista Valley portion prior to the pupping season and would continue activities until the end of March in the Midway Valley where the landscape is dominated by oil field land uses. All other

The Bureau believes that these modifications to the project do not change the manner or extent of the effects to the listed species that were described and evaluated in the environmental assessment, Section 7 consultation, and biological opinion. We do not expect this modification to result in any change in incidental take authorized in the biological opinion.

Bio Environmental Associates

Stephen P. Tabor, M.S.
TWS - Certified Wildlife Biologist

837 Arbor Ave., Suite A
Fort Collins, Colorado 80526
(970) 207-0575

12 February 1997

Larry Saslaw
U.S. Bureau of Land Management
3801 Pegasus Drive
Bakersfield, California 93308

RE: Chevron and Santa Fe Energy Resources, Inc. Midway 3D Seismic Project Completion Date Extension Request and Soil Moisture Modifications Proposal

Dear Mr. Saslaw:

During the recent Midway Valley 3D seismic project meeting, two issues were presented and discussed that require further clarification. We have summarized these issues below.

Completion Date Extension Request - The U.S. Bureau of Land Management (BLM) Record of Decision (ROD) states on page 37 of the Environmental Assessment "The geophysical permit shall be granted for a term of 120 days with the right of renewal" (signed 15 November 1996). The geophysical permit expires 15 March 1997. In addition to the ROD, the U.S. Fish and Wildlife Service biological opinion for this project states on Page 2 "In order to minimize potential impacts to threatened and endangered species within the project area, the seismic data acquisition is scheduled to begin November 1, 1996, and conclude by late-February 1997."

Because of rainfall received on the project site during the months of December 1996 and January 1997, numerous "no work" days for the project have occurred. In addition, vandalism has caused delays on the project primarily in and around the City of Taft.

Western Geophysical has informed us that because of delays, described above, the project will not be completed by the expected dates. A realistic completion date for all project activities would be 30 April 1997. At this time, the project proponents and Western Geophysical are requesting that the expiration date of the BLM ROD be extended to 30 April 1997 and that the Service concur with this extension.

Soil Moisture and Compaction Modifications Proposal - Because of soil variation across the project site, the 75% soil compaction guidelines presented in the EA are too restrictive. For example, there have been numerous occasions where vibroseis units have not been allowed to operate because of wetness at the particular area where the vibroseis units are located. Soils were too wet according to limits of the permit. Repeated attempts to find areas that are suitable in soil moisture content (dryness) where vibroseis could occur where some portions of the

project site are too wet under current guidelines takes considerable time. Because of this we are requesting, on behalf of the client, that:

1. The soil moisture and compaction criteria be modified to allow vibroseis to occur above the 75% level in areas where significant impacts to sensitive biological resources and their habitat(s) would not occur and in areas where significant erosion would not occur. The particular area where vibroseis is proposed still will be inspected on a case by case basis. For example, if vibroseis units are in areas where there are no sensitive biological resources vibroseis could be conducted and tire and pad imprints recontoured and filled if necessary.

2. This would facilitate vibroseis production and would allow the testing phase (both geophone layout and vibroseis) to approach and complete operations in the Buena Vista Valley (in a timely manner) where densities of listed and sensitive biological resources are high. This concept is critical to the success of the project and for the protection of sensitive species. Mitigation of project impacts to sensitive species can be better implemented and achieved by completing project activities within Buena Vista Valley prior to peak springtime activities of sensitive wildlife and special status plant species. It is anticipated that project activities will be concluded in the Buena Vista Valley by mid-March 1997.

3. Monitors will continue to measure and record tire and vibroseis pad depression depths and will make decisions based on microhabitat, topography, presence and density of sensitive biological resources with regard to allowing cross country vehicle travel to occur when the project site has received measurable rainfall. In summary, there are areas within the project site where operations can occur when soils are wet. However, cross country vehicle travel will be recommended against when soils are saturated (i.e., soupy, etc.). This will meet requirements of protecting habitats in times where wetness of soils limits project production.

Thank you for your time and attention to these requests. If you have any questions please call us at (970) 484-4467 or at (970) 207-0575. In addition, please feel free to contact Kristie Hammer at the project site regarding these issues.

Sincerely,

Stephen P. Tabor

Stephen P. Tabor
TWS - Certified Wildlife Biologist

cc: Roslyn Muller, Chevron
John Beery, Chevron
Scott Weathington, Western Geophysical
Russ Gentry, Western Geophysical
Joe Broussard, Western Geophysical

IMPORTANT DATES DURING THE MIDWAY VALLEY 3D SEISMIC PROJECT

Agency/client/Western Geophysical scoping meeting with BLM and DOE held at DOE for permitting questions and requirements = 7-18-96

Surveyor (Western Geophysical) start-up date = 9-13-96

Cable lay-out start-up date = 10-18-96

Cable pick-up completion date = 4-16-97

Vibroseis start-up date = 11-25-96

Vibroseis completion date = 4-14-96

Western Geophysical Holiday breaks = 11-28-96 - 12-1-96
12-24-96 - 12-29-96

BLM/Chevron/Western Geophysical meeting during project = 2-30-96

BLM Notice of Intent Form = 8-21-96

BLM Notice of Completion Form = 9-2-97

Western Geophysical
Crew 724
Safety Meeting Record

LOCATION: Taft, California
PROSPECT: Midway Valley 3D

CONDUCTED BY:
Mike Warrington

DATE: 11/25/96

TIME: 6:00 a.m.

TOPICS OF DISCUSSION: Authorized drivers list.

1. [illegible]
2. [illegible]
3. Travis Almer
4. [illegible]
5. [illegible]
6. Linzy Brown
7. Ron Ellis
8. Clarence Jackson
9. [illegible]
10. [illegible]
11. [illegible]
12. Mike Goblin
13. Kevin Wrachowski
14. [illegible]
15. Shawn Watson
16. Kelly Lungren
17. [illegible]
18. Steven Fletcher
19. David Kimpfe
Russell [illegible]
Bert [illegible]
Eric L. Gilson
Shaneal Stout
Scott Weathington
Grant Wright
Joe Broussard
20. Alma Cowherd
21. [illegible]
22. [illegible]
23. Faustino Quiñonez
24. Manuel Renteria
25. Ernesto Mahmer
26. [illegible]
27. Gregorio Vilchez
28. [illegible]
29. Luis Torres
30. SL [illegible]
31. [illegible]
32. Alfredo Pedraza
33. Tyler Thoren
34. Ron Bennett
35. Garrett B[illegible]
36. [illegible]
37. [illegible]
38. Bally Miller
39. Curt Walsh
40. Nancy Hylton
41. Joel L Renteria
42. [illegible]
43. [illegible] WILLIAMS
44. Gabriel Reedy
45. [illegible]
Larry Schultz

Chevron U.S.A. Inc.
P. O. Box 1392, Bakersfield, CA 93302

November 19, 1996

Ms. Heather Bell
U. S. Fish and Wildlife Service
3310 El Camino Avenue, Suite 130
Sacramento, California 95821

Dr. Jeffrey Single
State of California
Department of Fish and Game
1234 E. Shaw Avenue
Fresno, California 93710

Dear Heather and Jeff:

As required by the biological opinion for Chevron USA Inc. and Sante Fe Energy Resources joint Midway Valley 3D Seismic Project, Kern County, California, Chevron submits the following information. Steve Tabor, the project's biological resources consultant, first reported a dead San Joaquin kit fox within the project area to Chevron on November 18 at 1:50 p.m. Steve provided follow-up, detailed information at 11:40 a.m on November 19. I am providing this letter as Chevron USA Inc./Sante Fe Energy Resources project representative in accordance with the biological opinion's Terms and Conditions 2(d).

On 11/14/96 archaeologists working on the Midway Valley 3D seismic project observed a dead, adult female San Joaquin kit fox (SJKF). The archaeologists estimated death to have occurred on 11/13. The SJKF was found along source line number 5103, approximately 25 feet north of station number 5025, in the SW1/4 of the NW1/4 of Section 15, T32S/R23E. The cause of death is not apparent and has not yet been determined.

Western Geophysical ("Western"), the project's geophysical services contractor, staked source line number 5103 on 11/14/96 using foot travel and hand-held equipment. At station number 5025, Western used hand-held equipment within a 2 foot wide corridor. The dead SJKF is approximately 25 feet outside of the work corridor. The immediate area surrounding the SJKF shows no evidence of disturbance by a predators such as coyotes. Oilfield developments are 60 yards to the west of the SJKF (an insulated steam line, a flow line and a pipeline road).

CSUB's Center for Archaeological Research surveyed source line number 5103 on 11/14/96. Archaeologists accessed this source line by foot, parking vehicles on an adjacent road.

Midway Road is the closest county road (between ¼ and ½ mile west of the dead SJKF). An existing offroad trail is located 70 -80 yards west of the SJKF (and west of the existing pipeline access road).

If you have any questions about any of the information we have provided, please call me at (805) 633-4438. During the period of November 21 - December 1 John Beery will be taking my place as project representative. John's phone number is (805) 395-6306.

Sincerely,

Roslyn Muller

Roslyn Muller

Chevron U.S.A. Inc
P.O. Box 1392, Bakersfield, CA 93302

November 18, 1996

Mr. Steve Ray
U. S. Fish and Wildlife Service
2800 Cottage Way, Suite 120
Sacramento, California 95821

Dr. Jeffrey Single
State of California
Department of Fish and Game
1234 E. Shaw Avenue
Fresno, California 93710

Dear Steve and Jeff:

As required by the biological opinion for Chevron U.S.A. Inc. and Kern Fe Energy Resources joint Midway Valley 2D Seismic Project, Kern County, California, Chevron submits the following information. Steve Tucker, the project's biological resources consultant, first reported a dead San Joaquin fox within the project area to Chevron on November 12 at 1:30 p.m. Steve provided Chevron with the video information at 11:00 a.m. on November 18. I am providing this letter as Chevron U.S.A. Inc./Kern Fe Energy Resources project representative in accordance with the biological opinion's Terms and Conditions 2(d).

On 11/11/96 archaeologists working on the Midway Valley 2D seismic project observed a dead, adult female San Joaquin fox (SJKF). The archaeologists estimated death to have occurred on 11/13. The SJKF was found along seismic line number 5103, approximately 25 feet north of station number 5025, in the SW¼ of the NW¼ of Section 13, T32S/R23E. The cause of death is not apparent and has not yet been determined.

Western Geophysical ("Western"), the project's geophysical services contractor, staked seismic line number 5103 on 11/7/96 using foot travel and hand-held equipment. At station number 5025, Western began using heavy equipment within a 2 foot wide corridor. The dead SJKF is approximately 25 feet outside of the work corridor. The immediate area surrounding the SJKF shows no evidence of disturbance or a predation such as coyotes. Original development are 60 yards to the west of the SJKF (an inactive station line, a flow line and a pipeline road).

CSU-Fe Center for Archaeological Research surveyed seismic line number 5103 on 11/14/96. Archaeologists accessed this seismic line by foot, parking vehicles on an adjacent road.

Midway Road is the closest county road (between ¼ and ½ mile west of the dead SJKF). An existing offroad trail is located 70 -80 yards west of the SJKF (and west of the existing pipeline access road).

If you have any questions about any of the information we have provided, please call me at (805) 833-4438. During the period of November 27 - December 1 John Berry will be taking my place as project representative. John's phone number is (805) 395-6206.

Sincerely,

Robert Mueller

Robert Mueller

cc: Mr. Larry Saslow
U. S. Department of the Interior
Bureau of Land Management
3801 Pegasus Drive
Bakersfield, California 93308-6837

bcc: John Beery
Dan Jernigan
Jim Robinson, Sante Fe Energy Resources
Steve Tabor, BioEnvironmental Associates

APPENDIX G

BUREAU OF LAND MANAGEMENT

NOTICE OF INTENT

AND

NOTICE OF COMPLETION FORMS

UNITED STATES
DEPARTMENT OF ENERGY
NAVAL PETROLEUM RESERVES in CALIFORNIA

NOTICE OF INTENT TO CONDUCT OIL AND GAS GEOPHYSICAL EXPLORATION OPERATIONS

Naval Petroleum Reserves Production Act of 1976, as amended, (10 U.S.C. 7420 et seq.)
Department of Energy Organization Act of 1977, as amended, (42 U.S.C. 7101 et seq.)

Company Name	CHEVRON U.S.A., INC.	Project Name	MIDWAY VALLEY 3D SEISMIC SURVEY
Address	P.O. BOX 1392	Type of Bond/Insurance	Amount
City	BAKERSFIELD State CA	Bond Number/Where Filed/Certificate of Insurance	* TO BE PROVIDED *
Zip Code	93302		
LOCAL INFORMATION (Contractor(s) Insurance)			
Contractor/Client	WESTERN GEOPHYSICAL CORP.	Crew Chief	
Address	7229 S. ALTON WAY	Address	** TO BE DETERMINED **
City	ENGLEWOOD State CO	City	State
Zip Code	80112 Phone No. (include area code) (303) 770-8660	Zip Code	Phone No. (include area code)

I hereby file this Notice of Intent to Conduct Oil and Gas Geophysical Exploration Operations across and upon Public Lands (give description of lands by Township(s), Range(s), and Section(s): A map shall be furnished showing the approximate location of the lines to be used on Public Lands. The map shall be of a minimum scale of one-half inch to the mile for the general location, and should be at least two and one-half inches to the mile for specific project location to accompany the Notice of Completion.

ALL, OR PORTIONS OF, THE FOLLOWING SECTIONS (SEE ENCLOSED MAP):
36-30S/22E
1,12,13,14,23,24,25,26,35,36-31S/22E
1,2-32S/22E
31-30S/23E
5,6,7,8,9,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36-31S/23E
1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,21,22,23,24-32S/23E
19,20,29,30,31,32,33-31S/24E
4,5,6,7,8,17,18,19-32S/24E

NOTE: PROJECT IS LOCATED IN KERN COUNTY, CA., PROJECT MAP ATTACHED.

Approximate Date of Commencement of Operations: 11-01-96

The type of operation to be conducted is:

TECHNIQUE	METHOD
☐ Shothole	☐ Surface shot
☒ Vibroseis	☒ Truck Mounted
☐ Other (explain)	☐ Portable
	☐ Buggy

Type and amount of Explosive:	N/A
Shotpoint pattern:	STAGGERED BRICK PATTERN
Shothole Depth:	N/A
No. Source Points/Mile:	165' SHOT INTERVAL = 32 SHOTS/MILE
Provide diagram if multi-hole pattern:	N/A

The undersigned agrees that the oil and gas exploration operations shall be conducted in compliance with all Federal, State and local laws, ordinances or regulations which are applicable. Federal regulations are contained in 43 CFR 3150, and are referenced herein for guidance purposes. The Crew Chief, Party Manager, or other responsible representative shall attend a pre-work conference prior to entering onto the public land to sign the general terms and conditions relative to this project, and any site specific special conditions developed by the local Authorized Officer.

(Signature of Appropriate Geophysical Representative)	(Signature of U.S. Department of Energy Authorized Officer)
LOUIS F. KLONSKY	
GEOPHYSICAL COORDINATOR	
(Title)	(Title)
8-21-96	
(Date)	(Date)

ATTACHMENT

Chevron

September 4, 1997

Chevron U.S.A. Production Company
4900 California Avenue
Bakersfield, CA 93309
Post Office Box 1392
Bakersfield, CA 93302

Cynthia A. Giumarra
Assistant General Counsel
Law Department
Phone No. 805 633 4695
Fax No. 805 633 4698

Mr. Russ Lewis
United States Department of Interior
Bureau of Land Management
3801 Pegasus Drive
Bakersfield, California 93308

NOTICE OF COMPLETION on Chevron's Notice of Intent to Conduct Oil and Gas Geophysical Operations: Midway Valley 3D Seismic Survey, Kern County, California

Dear Mr. Lewis:

Pursuant to our recent telephone conversation, enclosed please find Chevron's Notice of Completion for the above referenced Geophysical Operation. The work contemplated by Chevron under this Notice of Intent has been completed. The actual work performed, however, did not cover all of the sections listed in the Notice of Intent. Specifically, the following sections overlying the Naval Petroleum Reserve No. 1, owned by the United States Government, were excluded from the survey: 32 in T30S/R23E, and 3, 4, 10, 11, and 14 in T31S/R23E.

Please let me know if you have any questions concerning this matter. I look forward to receiving written confirmation from you of the closure of your file for this seismic survey.

Sincerely,

Cynthia A. Giumarra

Cynthia A. Giumarra

Attachments

Bcc: Mr. Greg Thorpe - without Map
Mr. Bill Kempner - without Attachments

Form 3150-5
(December 1991)
(formerly 3045-2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0162
Expires: August 31, 1993

NOTICE OF COMPLETION OF OIL AND GAS EXPLORATION OPERATIONS

Company Name: Chevron U.S.A., Inc.	BLM Case Number
Address: P.O. Box 1392	Crew Number
City: Bakersfield; State: CA	Crew Chief
Zip Code: 93302; Phone Number (include area code): (805) 395-6556	

1. List the public lands described in the Notice of Intent to Conduct Oil and Gas Geophysical Exploration Operations that were crossed by the geophysical activities. Give description of lands by Township(s), Range(s), and Section(s).

36-30S/22E
1,12,13,14,23,24,25,26,35,36-31S/22E
1,2-32S/22E
31,32-30S/23E
3,4,5,6,7,8,9,10,11,14,15,16,17,18,19,20,21,22,23-31S/23E
26,27,28,29,30,31,32,33,34,35,36-31S/23E
1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17-32S/23E
21,22,23,24,25-32S/23E
5,6,7,8,17,18-32S/24E

NOTE: Project located in Kern County, CA.

2. Number of miles of line completed on public land: (see map)

3. Attach shot point or field maps showing actual line locations and any access routes. The map(s) must be a minimum scale of 1:24,000 (7 1/2 minute USGS quadrangle or equivalent). If reproductions are used, they must be good quality and legible. Public lands that are crossed must be indicated.

4. Describe the hole plugging process used, if appropriate to the project. N/A (Vibroseis survey)

5. If requested by the Authorized Officer, attach a copy of the "Hole Plugging Log" describing each hole for all shot-lines. Specify whether holes were wet or dry, identify static water level, flowing holes, breached or caved holes, lost hole locations, etc.

6. Describe surface disturbance other than source points and the reclamation performed. N/A

I CERTIFY That the oil and gas exploration operations approved under the Notice of Intent, Case No. _____ and described above were completed on April 19, 1997. All Terms and Conditions attached to the approved Notice were complied with.

(Signature of Appropriate Geophysical Representative) — 9-2-97 (Date)

Louis F. Klonsky

Geophysical Coordinator
(Title)

Title 18 U.S.C. Sec. 1001 makes it a crime for any person knowingly and willfully to make to any Department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on reverse)